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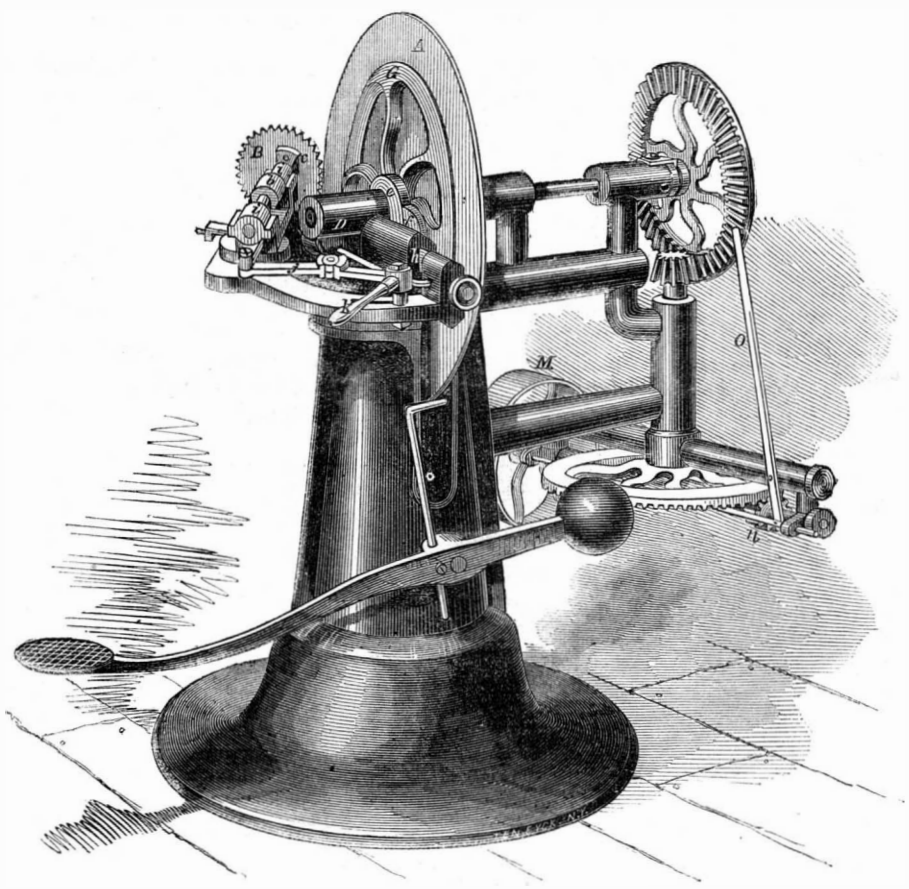
IMPROVED BARREL HEAD-CUTTER.

The invention which is here illustrated relates to one of those details in an important operation which, as the arts approach perfection, become constantly more and more common. As wood shrinks more across the grain than it does with the grain, it is found desirable to form barrel heads not entirely round, but of an oval shape, a little longer across the grain than with it; so that they may be more nearly circular after shrinking. It is the principal object of this invention to accomplish that end.

The machine is one of that class in which the head is cut out by a dished, circular saw, and the oval form is produced by giving the axle of the saw a horizontal motion, vibrating twice back and forth during each revolution of the head; thus carrying the center of the head alternately nearer to the saw and farther from it. In the cut, the barrel head, A, is secured between two clamps in the usual manner, and is caused to rotate slowly, so as to bring the edge to be cut in contact with the circular saw, B; this saw having the cutters, *c*, secured upon its concave face for cutting the outer bevel on the edge of the head. The journal-box, D, of the clamp, G, receives a horizontal, reciprocating motion, along the slide, *h*, from the eccentric, *e*, which is rigidly secured to the clamp, and which runs against the fixed wiper, *f*; the eccentric being held against the wiper by a spring. The stuff is so placed in the clamps in relation to the eccentric that it is pressed nearer to the saw when the grain is horizontal, and is drawn farther from it when the grain is perpendicular, which arrangement, it will be seen, causes the head to have a larger diameter across the grain than it has in a direction with the grain.



M'NISH'S IMPROVED BARREL HEAD-CUTTER.

In order to adjust the machine to heads of different sizes it is necessary to move the saw to a greater or less distance from the center of the clamps. For this purpose the bearings, *i i*, of the saw-shaft are cast together in one block, and this block is fitted to slide back and forth, being secured in position by a set-screw. The set-screw is near the middle of the block, and serves as a fulcrum about which the block may be turned, whenever it is moved along endwise, in order to keep the saw in proper relation to the plane of the clamps, or of the barrel head. As this change in the position of the saw would alter, somewhat, the position of the saw in relation to the barrel head, a second adjustment is necessary to correct this alteration. This is effected by placing the set-screw fulcrum in a plate which is secured to the solid parts of the machine by a second set-screw eccentric to the one first named, so that the fulcrum of the journal-box block may be carried around this second set-screw.

The turning of the journal-box block is effected by means of the toggle-joint, *j*, and handle, *k*. The saw is driven by a belt upon the pulley, *l*, and the clamps are rotated by a belt on the pulley, M; the shaft of the pinion, *n*, being thrown, by a clutch, into connection with this pulley by means of the lever, O. The bent rods, *p*, serve as rests for the stuff when it is placed between the clamps, and they are drawn out of the way so that the stuff may revolve when the treadle is pressed down, to bring the farther clamp against the stuff. This farther clamp is not shown in the cut, but it is connected with the treadle by a bent lever, and is furnished with spikes upon its face for holding the stuff.

Application for a patent for this improvement has been made, through the Scientific American Patent Agency, and further information in relation to it may be had by addressing the inventor, H. L. McNish, or the half-assignee, D. C. Butler, at Lowell, Mass.

THE CIGAR STEAMER AGAIN.—The Baltimore correspondent of the Charleston (S. C.) *Courier* has the following about the above steamer:—"This (cigar) steamer is one of the funniest-looking things imaginable. It resembles somewhat a huge whale with its back out of water. Each end comes to a point sharp as a needle. It is designed to plunge through waves, storm and tempest, going under, if necessary, all save the pilot's house or platform, which is elevated many feet above the upper deck. Mr. Winans is still sanguine, more than ever, that his plan of ocean steam navigation will be a success. He has, on trial trips, made 20 miles per hour, and, it is said, has the full knowledge within himself, from private experiments, that his boat can be got up to an average speed of 30 or 35 miles per hour. So confident is he that the invention will eventually succeed, that, in due time, he proposes to build another vessel, of similar construction, on a much more extensive scale. The one now built has cost him $200,000."

[Mr. Winans can expend his money to far better advantage for the good of mankind than in building another cigar steamer.—EDS.

A NEW RIFLE WEAPON.—A Springfield correspondent of the Hartford *Times* thus describes a new weapon just completed at the armory in that city:—"A heavy gun, called the 'wall rifle,' has just been finished at the Springfield armory, and sent to the Ordnance Department at Washington. It was proposed by that department, approved by the Secretary of War, and built at the armory under the superintendence of the master armorer, Erskine S. Allen, then acting-superintendent. It is a breech-loading piece of the following dimensions:—Length of barrel, 4 feet; stock, 19 inches; diameter of barrel at breech, 2⅜ inches; at muzzle, 1 15-16ths inch. It carries a Minié ball weighing ½ a pound, 19-100ths of an inch in diameter. It is loaded with 384 grains of powder. The barrel is of cast stee., with five grooves or rifles, of ratchet form. The lock frame is different from that of other breech-loading pieces. It is hung on a pivot and, when closed, presents a smooth surface, all the machinery being inside. The gun is suspended on a pivot rod as a rest and to prevent the recoil from hurting the shoulder. The weight of the gun is 85 lbs. It is intended wholly for wall service, in forts, &c., to be used in picking-off officers, and for other such purposes. It is now being experimented with by the Board of Ordnance at Washington."

[We cut the above description of a new swivel gun from an exchange. It is manifest that the dimensions of the bore are not correctly given, as a shot weighing half a pound and less than the fifth of an inch in diameter would be altogether too long.—EDS.

TO PREVENT SKIPPERS IN HAMS.—In a communication to the *Cotton Planter*, Mr. W. McWillie says:—"There is, according to my experience, nothing easier than to avoid the skipper and all worms and bugs that usually infest and often destroy so much bacon. It is simply to keep your smoke-house dark, and the moth that deposits the egg will never enter it. For the past twenty-five years I have attended to this, and never have had my bacon troubled with any insect. I have now hanging in my smoke-house hams one, two and three years old, and the oldest are as free from insects as when first hung up. I am not aware of other causes for the exemption of my bacon from insects, but simply the fact that my smoke-house is always kept dark. Before adopting this plan, I had tried many experiments, but always either without success or with injury to the flavor of my bacon. I smoke with green hickory—this is important, as the flavor of bacon is often utterly destroyed by smoking it with improper wood."

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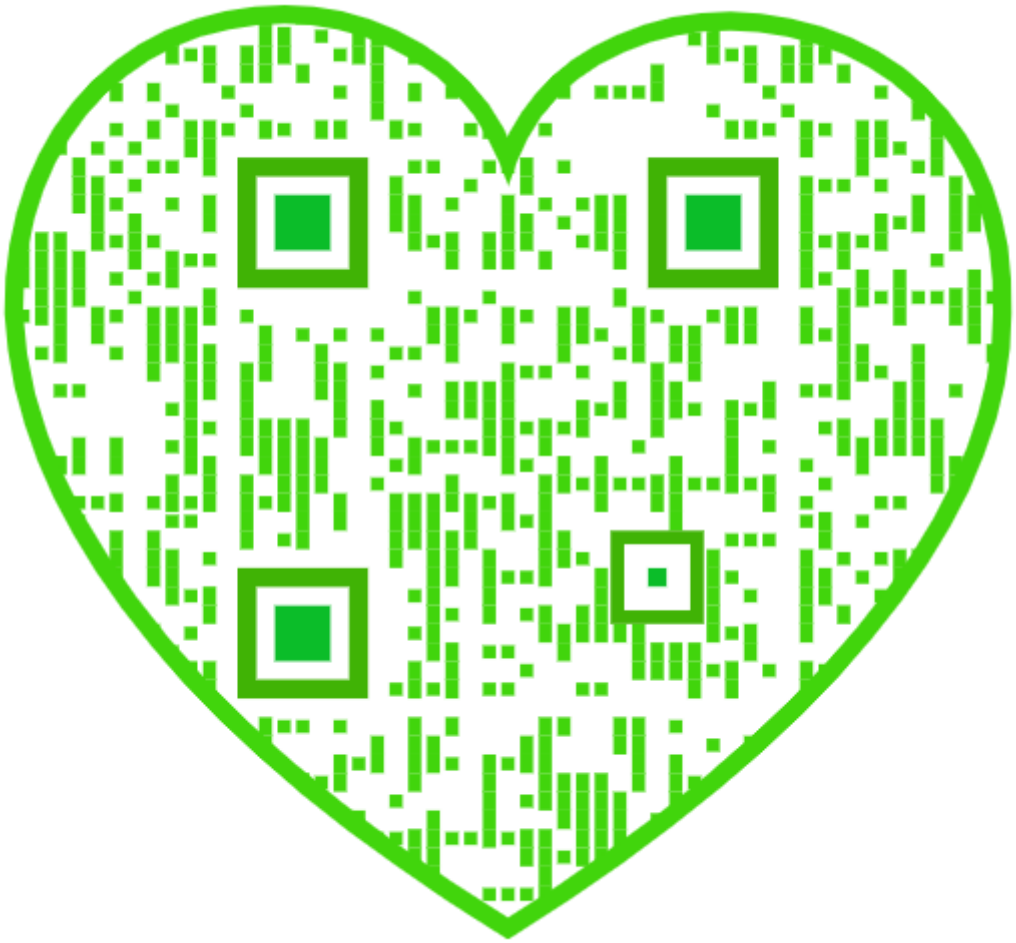

BISULPHIDE OF CARBON IN COAL GAS.

The *Quarterly Journal* of the London Chemical Society contains the following scientific information on this intricate subject, by Professor A. W. Hoffman, F.R.S.:—

It is well known that coal gas, even when submitted to the most improved process of purification, retains a minute quantity of a sulphur compound, which yields sulphurous acid when the gas is burned. A commission, consisting of Professors Faraday, Hoffman and Tyndall, Mr. Regrave, R. A., and Captain Fowke, R. E., having been appointed for the purpose of reporting to the Lords of the Committee of the Privy Council on Education on the lighting of picture galleries by gas, and on any precautions, if necessary, against the escape of gas and of the products of its combustion, Professor Hoffman undertook a few experiments with the view of determining the amount of sulphur generally present in the London coal gas.

The object of the inquiry being to ascertain the quantity of sulphurous acid capable of being formed by the combustion of the gas, an exceedingly small jet of gas, carefully washed with acetate of lead (which showed the absence of sulphureted hydrogen) and measured by an accurate experimental meter, was burned in a large, two-necked glass globe. Through one of the necks, the gas tube was conveyed into the globe; while the other, fitting into a condenser, carried off the product of combustion into a two-necked receiver. To establish a current of air, the receiver was connected with a water-current aspirator; a couple of Woolfe's bottles, containing water or dilute ammonia, being inserted for the purpose of fixing any trace of sulphurous acid which might escape condensation, with the water, in the receiver. The experiment being terminated, the liquids in the receiver and in the wash-bottles were united, oxydized with chlorine, and precipitated with chloride of barium.

Experiments in December, 1859, and January, 1860.

Experi'ts	Quan'y of gas consumed	Am't of sulp'te of barium.	Amount of sulphur in 100 cubic feet.		Amount of sulphur in 100 c'ic m'rs
	Cubic ft.	Grammes	Grammes.	Grains.	Grammes.
1.....	2	0.0890	0.611	9.43	21.585
2.....	2	0.0953	0.654	10.10	23.111
3.....	2	0.0975	0.669	10.33	23.644
4.....	2	0.0935	0.642	9.91	22.677
Mean....	..	.....	0.644	9.94	22.754

These experiments show that the amount of sulphur remaining in the London gas after the removal of the sulphureted hydrogen is very small, and that in winter it is somewhat greater than in summer; this may possibly arise from the enormously-increased production of gas during the winter months, when it will be more difficult to regulate the several processes involved in its manufacture. But the result may also be purely accidental, arising from a change in the nature of the coal used, &c. A much more extended series of experiments would be required to decide this question.

It has long been assumed that the sulphur in purified gas exists in the form of bisulphide of carbon; the conditions for the generation of this compound being, in fact, given in the ordinary process of producing gas. That coal gas really contains bisulphide of carbon, was first elegantly proved by Vogel, who, at the suggestion of Baron Liebig, passed a current of purified gas through an alcoholic solution of potassa, when xanthate (sulpho-carbonate) of potassium [K (C^2 H_5) CS^2 O] was formed, which produced in copper solutions the highly-characteristic yellow precipitate of xanthate of copper, and yielded, when boiled with a few drops of nitrate of lead, in the presence of free potassa, a black deposit of sulphide of lead. When engaged in the above inquiry, I repeated Vogel's experiments, which I can confirm in every particular. The amount of bisulphide of carbon in the London gas is, however, so small that a very large volume must be passed through the alcoholic solution of potassa in order to produce a sufficient quantity of xanthate of potassium. After a cubic foot of gas has been passed through alcoholic potassa in a bulb apparatus, the solution gave, with sulphate of copper, a leek-green precipitate, in which the presence of xanthate was but imperfectly indicated. Only after passing several additional cubic feet the yellow color became more distinct, although still masked, to some extent, by the hydrated protoxyd simultaneously precipitated. On the other hand, the black precipitate of sulphide of lead was obtained without difficulty, even after the passage of one single foot of gas.

But the presence of bisulphide of carbon in coal gas may be exhibited, even more elegantly and with greater precision, by means of *triethylphosphine*, which produces with the bisulphide a compound crystallizing in splendid prisms of a ruby color. This body is so characteristic, and forms with so much facility, that bisulphide of carbon has become a most valuable re-agent for triethylphosphine and its homologues. The idea naturally suggested itself to employ the phosphorous base for the detection of bisulphide of carbon in gas. On distilling a considerable proportion of coal-gas benzole, there was collected a small fraction, which came over in the commencement below 65°. When mixed with triethylphosphine, this liquid solidified into a mass of the well-known ruby crystals. Four or five drops of triethylphosphine were dissolved in ether, the ethereal liquid was introduced into a bulb apparatus, and a current of coal gas allowed to bubble through the solution. When 0.2 of a cubic foot had passed, the liquid had assumed a distinctly red coloration, the intensity of which increased as the passage of the gas and the evaporation of the ether continued. After 0.8 of a cubic foot had passed, the whole of the ether had evaporated, and the inner surface of the bulb apparatus was lined with a beautiful net-work of ruby crystals.

[A gramme is 15.444 grains. Chemists are now using the French measures in their experiments.—EDS.

WATER GAS AGAIN.

MESSRS. EDITORS:—A copy of the SCIENTIFIC AMERICAN of the 21st ult. has been placed in my hands by a friend, who directed my attention to an article upon the subject of water-gas, published on page 57. You refer to the water-gas now being used in Narbonne in France. This you assert is *real* water-gas; it being pure hydrogen. If the citizens of Narbonne burn pure hydrogen gas (and they did a brief while ago, but were discontented with it) then their illuminating vapor is not *real* water-gas, as one of the constituent gases of water is absent. The light given by the Narbonne gas is a very indifferent one, as it is derived from the heat of the burning hydrogen impinging upon platinum, which metal becoming white hot, gives out an illumination which is far from being satisfactory. The first experiments I made upon water-gas were similar to those formerly burned at Narbonne (for I believe it has been discarded) but it proved so unsatisfactory that I was soon induced to give it up.

You were pleased to term the gas of Mr. White and that which I prepare from water a "so-called water-gas," and which you designate as a mixture of the gases resulting from the decomposition of water with that generated from resin. I regret that before you had so frequently reiterated such a statement, you had not learned its absurdity by actual experiment. It has been ascertained, after the production of several millions of cubic feet of my water-gas, that twenty-five pounds of resin will properly carbonize 1,000 cubic feet of this gas until it gives out an illumination one-third greater than ordinary coal gas. Now, we all know, that resin when used *per se*, will produce but *one hundred and fifty* cubic feet of gas. If the addition of twenty-five pounds of resin—added to the light carbureted hydrogen and the carbonic oxyd gas produced from water by its decomposition in the presence of ignited carbon—produce 1,000 cubic feet of gas which give out an illumination fully equal to the gas generated from resin, then how do you sustain your assertion that my water-gas is resin gas diluted? It is just this species of dilution which the public want.

The above assertions relative to the quantities of the gas produced, and the illuminating properties of it are susceptible of demonstration. You can satisfy yourself upon these points, by calling upon the engineer of the water-gas works at the Girard House, Philadelphia, where you can witness the manufacture of the gas, and examine the statistical tables there obtained. But I wish to direct your attention to another fact, of which I desire that you will satisfy yourself experimentally. If resin is allowed to flow into ignited carbon at the temperature necessary to produce good water-gas, there is not produced any illuminating gas whatever, but on the contrary such a large quantity of carbonic acid gas is generated that *no illumination* is the result. Thus you perceive that my water-gas cannot be the constituent gases of water diluted into resin gas—or as you would have it, the light is not derived from the resin gas, as there is none of that, as an illuminating gas, present.

I have thought proper to mention these facts to you, so that before you again assert that the water-gas derives its light-giving properties from resin gas, that you will investigate the subject experimentally. Your description of the illuminating gas used at Narbonne, France, is very obscure and unsatisfactory. You inform us that the vapor of water is passed into a furnace, and that the resulting carbonic oxyd and light carbureted hydrogen gases are taken out from above. But from what source do they derive that amount of carbon necessary to impart illuminating properties to these gases, or rather to the latter gas? If they attempt to give illuminating qualities to these gases derived from water, they will necessarily be forced to resort to the use of some hydrocarbon for that purpose. In that case, if they are successful, and adopt the most feasible plan, they would at once infringe my patent there. In fact, so impressed are these very manufacturers with this trouble, that they are now in communication with my agent in France, upon the subject of the introduction of my water-gas instead of the insufficient light they have hitherto been making.

In conclusion, I would say, that after the manufacture of over five million cubic feet of my water-gas, those possessing it have arrived at the conviction, that it is the cheapest, and most brilliant gas that can be made. In fact, so strong is this conviction, that despite the interested opposition of heavy capitalists, they have resolved to introduce the water-gas to the public, in all the principal cities in this country and Europe.

J. MILTON SANDERS.

New York, August 11, 1860.

[The article above alluded-to was given principally as a new method of obtaining hydrogen from water; Dr. Sanders entirely misapprehends the spirit of the language we employed. We said, "This system seems plausible, but requires the practical test to fix its value. The gas thus produced on burning gives little light, but great heat. Light is secured by adjusting over the burners coils of fine platinum wire." Our correspondent has mixed up his statements regarding the gas made from water, resin, and incandescent coke by his process, in such a peculiar manner, with remarks which we made about it more than a year ago, that it is very difficult to understand what he means. Those of our readers who desire to know what he has invented, will find the specification of his patent published on page 286, Vol. I. (new series) of the SCIENTIFIC AMERICAN.

We have given this subject greater attention than Dr. Sanders seems to understand. We examined "White's water-gas," when it was on exhibition in Castle Garden, this city, several years ago, and before our correspondent made such a public demonstration of his system. There have been so many water-gases got up for illumination, and all so similar with regard to their mechanical and chemical defects, that when we fall in with something useful and new in this line we shall certainly give it due credit. A painful controversy lately took place between a committee in charge of Dr. Sanders' invention, in the Girard House, Philadelphia, and Mr. Cresson, chief-engineer of the City Gas Works. We take no party views of this question, any further than to say, that the former did assert that Sanders' gas was cheaper than that obtained from coal, while Mr. Cresson made a contradictory assertion. We really wish that all that has been uttered regarding the great superiority and economy of this water-gas was true, but judging the subject in a scientific and practical light, we reject some statements made in favor of it, as being far too highly colored. Our opinions regarding the science of the subject—and these meet all the statements in the above letter—were published editorially on page 289, Vol. I. (new series) of the SCIENTIFIC AMERICAN.

AN important problem was that of readily obtaining pure silver from old, worn-out plated utensils of copper, &c. A recent number of the *Moniteur Scientifique* publishes valuable information on the subject, by M. Soelzel. The best method consists of treating the plated work by sulphuric acid, in which from 5 to 10 per cent of nitrate of soda has been dissolved. The silver disappears as if by magic in this solution, before any of the copper is at all acted upon.

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FRICTION—THE PHILOSOPHY OF SMALL AXLES.

MESSRS. EDITORS:—The statement so universal in treatises on mechanics, that friction is independent of the amount of bearing surface, is sometimes misinterpreted as an argument to prove that the power required to move a wheel with a large journal is no greater than that required to move a similar wheel with a small journal. In treating of friction, it must be borne in mind that there are two elements which combine to determine the amount of power consumed by it. One is the constant *force* which is exerted by the rubbing surfaces; the other the *space* through which the rubbing surfaces move with reference to each other. The *power* necessarily expended in overcoming friction is the product of the force and space. Thus, if the force required to slide iron over iron is 30 pounds for every tun; to slide a tun five feet would consume a power of $30 \times 5 = 150$ feet-pounds, equivalent to raising 150 pounds one foot high. Hence to diminish the power consumed, it is necessary to reduce either the force exerted by friction, or the space passed over by the rubbing surfaces. To reduce the force of friction, unguents, as tallow, oil, &c., are introduced. To reduce the space passed over, small axles are employed, and this is the way in which they operate. If the diameter of a wheel is ten times that of its journal, while a point on the circumference moves 100 feet, a point on the journal moves but ten feet. If such a wheel was attached to a carriage; while the carriage moved forward 100 feet, the rubbing surfaces would only move ten feet with reference to each other. If, again, the diameter of the wheel was 20 times that of the journal, while the carriage moved forward 100 feet, the rubbing surfaces would only move five feet with reference to each other. Hence while the *force* exerted by friction would be the same in both cases; the *space* over which the *force* moved would only be half as much in the latter case as in the former; consequently, by reducing the journal one-half, we save one-half the *power*. While it is evident, then that the power required to overcome friction varies directly as the diameters of the journals, it is independent of the length of the journal, for "friction is independent of the amount of bearing surface."

JOS. W. SPRAGUE.

Rochester, N. Y., August 6, 1860.

[After the reception of this article, we received an able communication expressing similar views on this subject from a correspondent (E. F., of Saratoga, N. Y.), and but for this circumstance, it would have found a place in our columns. It refers more particularly to the article on the friction of axles published on page 49 of the present volume of the SCIENTIFIC AMERICAN, which was of such a character as to draw out correct information with respect to the friction of wooden and iron axles, and the journals of machines in general. The above communication of Mr. Sprague clearly explains the philosophy of friction on axles. It is undoubtedly double on a 6-inch that it is on a 3-inch axle during each revolution, and it is the same with vertical as it is with horizontal shafts. In constructing machines, however, especially those which require vertical shafts, caution must be observed not to make the revolving bearing snrfaces too small, because an increase of friction may be a minor evil. By concentrating the pressure in a narrow space to avoid friction, the surfaces are liable to heat and wet, and soon wear out. We have known this to take place in the boxes of several presses. The lower end of a vertical shaft reduced to a point becomes a drill. Very hard bearing surfaces obviate the evil of *cutting*, where the moving parts are light, such as in fine watches.—EDS.

THE SWIFTEST YACHT IN THE WORLD.—The yacht *Maria* beat the *America* before the latter went to Europe and took down the bunting from the fastest yachts in the British fleet. Formerly the *Maria* was sloop-rigged, but this year, her owner, Mr. Stevens, of Hoboken, has lengthened her, by adding about six feet to her stern, and altered her rig to a schooner. Her masts are not round, but flat-sided, and it is claimed that by this form the wind goes direct into the sail. Each of these masts is 24 inches in diameter; and the sails, instead of being attached to hoops as is usual, are secured to a combination of small rollers, which fit into a slot and traveler, and by this means the sails sit closer to the mast.

OVERSHOT AND JONVAL TURBINE WHEELS.

MESSRS. EDITORS:—The inquiries made by Messrs. Fain & Co. are very important to them, especially if the quantity of water in the stream is very variable at different seasons. The data given by Messrs. Fain & Co., as the capacity of the stream during low water, do not show a very large power (about 14 effective horse-powers); and from this I judge that, during other seasons, the capability of the stream is very much increased. If this is the case, the safest and most economical motor they can use is a well-made *overshot* wheel; when I am applied to regarding such streams, I always recommend such an arrangement. If there is considerable variation in the quantity of water in a stream, I would advise the use of *two turbines*, together equalizing the capacity of the stream when it yields the greatest quantity of water—one wheel being made for about two-thirds the total power and the other for about one-third, or some such combination, is a good plan of arranging turbines. But such arrangement for a small light stream increases the cost of motors, fore-bay and gearing, beyond the advantage gained over the overshot wheel (well constructed). It is an important matter to have any system of turbines properly calculated and well constructed, as in this lies the principal cause of their superiority as motors. Of course there may be circumstances—such as backwater keeping up for a considerable length of time, rocks or other obstructions in the way of making a proper wheel-pit, &c.—that may make the overshot a costly and objectionable wheel for the locality; but if the above objections do not exist, with a fall of 18 feet and, as I suppose, a very *variable* supply of water, a well-made overshot wheel is the best motor that Messrs. Fain & Co. could use. If, however, the supply of water is *not* subject to great variations, the jonval turbine, properly constructed, is the best motor; and it will yield the highest per-centage of effective power.

I address this communication to you, Messrs. Editors, and you may make any disposition of it you deem proper. Mr. Geyelin is at present in the upper part of your State, but the above is in accordance with his replies when such queries are made.

EMILE GEYELIN (by H. J. T.)

Jonval Turbine Office,
Philadelphia, Pa., Aug. 3, 1860.

P. S.—The fall is not at all an important question, but whether the supply of water by the stream is variable or constant *is*.

[The foregoing important communication is an answer to a letter addressed to us by Messrs. S. N. Fain & Co., of Mossy Creek, Tenn., which letter we submitted to the judgment of Mr. Geyelin; and as that gentleman is a designer and manufacturer of *jonval turbines*, the advice given in the above reply, recommending an overshot wheel for the particular situation described, must be held to be quite disinterested. Besides the irregularity of water supply, rendering overshot wheels better adapted than turbines for some situations, the kinds of work to be performed by a wheel should be taken into consideration. Where the work to be done is variable, such as working hydraulic pumps in in pressing cotton or oil, or in working rolling mills and iron-squeezers, the overshot is the most suitable wheel. Thus, in pressing cotton, power required should be accumulative—increasing as the pressure increases. This is affected by an overshot wheel with *spacious* adaptable buckets. As the pressure increases, its motion is retarded and each bucket receives a greater quantity of water, thus increasing the weight in the buckets and the power exerted by the wheel to meet the circumstances of the case.—EDS.

THE NOISE OF THE AURORA BOREALIS.

MESSRS. EDITORS:—The SCIENTIFIC AMERICAN being desirous of chronicling facts rather than speculations, I have a few words to say regarding the aurora borealis, or northern lights. These mysterious meteoric streamers in the heavens have been the subject of much speculation and even dispute; and as I rather suspect the general decision is that they are quite noiseless, I can testify to the fact that they *have* a noise, although I never heard them but on one particular occasion. When in the West of Scotland, about the year 1815, quite a number of us (young men) were enjoying ourselves in the open air on a fine evening, in the summer season. The aurora borealis was shooting athwart the sky in exceeding brilliancy, and purely white; although these streamers are quite a common occurence in that country, yet on that evening, we were all, as with one accord, attracted to the strange phenomenon of the rustling sounds that they were producing, and after watching them for a considerable length of time in admiration, we began to compare our fancies as to what the sounds most resembled. The majority declared it like a small train of gunpowder laid along the surface of the ground, having an extra quantity laid in little heaps about a foot apart, the train being fired goes fizzing, with little puffs as the fire reaches the little heaps deposited along the line of the train. I hope your readers can fancy the sounds that would be thus produced by such a train of gunpowder on a fine calm evening. The other party (of which the writer was one) compared it to the soft crackling sounds produced by the shaking of a sheet of fine tissue paper held in the hand. But it is worthy of remark how closely we agreed as to the mellow soft sound of the heavenly visitors. I hope the distant date of the observation will throw no objections to my testimony, that the aurora borealis *is* actually accompanied by sound, although rarely heard and still more rarely noted down.

JOHN THOMSON.

Wayne Center, Ill., August 9, 1860.

[The question whether the aurora borealis is accompanied by any noise has been much discussed, and this direct and positive testimony will be deemed valuable by all who are interested in the subject.—EDS.

QUESTIONS IN PATENT LAW.

MESSRS. EDITORS:—In reference to infringements, I would like to have you answer the following question, as many farmers are deeply interested in it:—Suppose A owns a patent machine, and that B gets up an infringement, and comes to do a job for C. Would C be liable if he gave B employment, without notice of infringement; and would C be liable to A in giving B a job *after* notice of infringement? W. R. B.

Oskaloosa, Iowa, August 10, 1860.

[In reply to the above inquiry, we have to say that any person using a patented machine without authority from the patentee is liable to an action for infringement. And, as a general rule, the person who employs another to use such a machine is liable for the act of his agent, and may be sued, also, as an infringer. This principle, however, has its limitations. If you employ a tailor to make a coat, and, in making it, he uses a sewing machince which is an infringement upon some person's patent, you are not liable. You employ the tailor *to make the coat*, and not *to use the sewing machine wrongfully*. So far as that is concerned, he is not your agent, and you are not responsible for his acts. So it is with one who is employed to harvest a field of grain. If you furnish him with a machine and set him at work, you will be responsible, in case the use of the machine is an infringement upon any person's patent. But if you merely employ him to harvest a field of grain, and he sees proper to use such a harvester as is an infringement upon some patent, you will not be responsible.—EDS.

MESSRS. EDITORS:—I own the patent right (for several counties) for a grain drill. There is a firm outside of my territory manufacturing the same kind of a drill, and they have sold some at their shop to men living *in* my territory; now what can I do with those farmers who bought from that firm? D. S.

Chambersburg, Pa., August 11, 1860.

[For the mere buying and owning of those drills, the farmers are not liable to you; but they *do* become liable the moment they commence to *use* one within the territory owned by you. You have the exclusive right to make the drill, use it, and sell it to others to be used, within your territory. Any person who does either of these things within the counties owned by you will have trespassed upon your rights, and will be liable to an action for an infringement.—EDS.

A WINDMILL WANTED.—From a letter on other matters from John A. Avirett, Jr., of Summerfield, Ala., we make the following extract:—"Hot—hotter—hottest! We have no rain; everything is burned-up in the way of gardens, and grain and cotton are beginning to suffer terribly. Can you tell me the address of the patentee or maker of a good fan or blower? I much want one, and will pay a good price for a good article."

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AERIAL NAVIGATION.

MESSRS. EDITORS:—Mr. Hyatt's offer of $1,000 (published on page 88, present volume of the SCIENTIFIC AMERICAN, for "the best flying machine" (a *real* flying machine) is a step in the right direction; but $100,000 or even $1,000,000 for the patent right alone would be more in accordance with the importance of the invention. Men, heretofore, have been too incredulous on this subject; and inventors are too much afraid to give it their serious attention. No one invention of man has ever yet made such a revolution in his affairs, as a true, good and useful flying machine would make. No mode of traveling could be half so delightful, inexpensive, expeditious or safe. One might then move in trackless courses, fast or slowly through the air. To move a machine horizontally, at the hight of one foot or but a few feet above the ground, is all that ordinarily would be required; and if there should be a fall thence, whatever the horizontal impetus, the results would not be serious. We can conceive of a machine which, like the hummingbird or garden-fly, might balance itself in the air, or move about at most any desirable speed, either just above the ground or much higher up, without danger, but to the great pleasure and ease of its occupants. Already in anticipation, we see it on its flight to tropical countries, returning quickly with southern fruits and flowers. Such a machine would form an easy and rapid means of intercourse amongst all men—interchanging ideas and friendly visits, and in fact altering and improving much of our present modes of life. Then indeed would we be able to know more of ourselves and of the globe on which we dwell. Practically speaking, we should *condense* the whole earth into a small proportional part of what it now is; and yet make it *more capacious* for our use, and *more productive* than it ever was before.

No one possessing a proper knowledge of the atmosphere can doubt its capability, under motion, of sustaining heavy bodies. In order to fly we only need the knowledge and means of bringing out its latent powers. Balloons are bulky, at the mercy of the winds, and otherwise objectionable; better to do without them if we can. It may be that a balloon only just large enough to support the weight of one attendant could be arranged with blowers, somewhat like a rocket, so as to accomplish a good result. These blowers (or fans, which, by the way, are as yet very imperfectly understood) must do away with the necessity of letting off gas and throwing out ballast, such as now makes a continued journey with balloons so difficult. The great bulk of balloons, however, makes it very desirable to get clear of them entirely.

It has already been suggested, in former times, that for flying we want *a new motive power*—one possessing great force, and yet produced by light materials. He who invents such a power—safe and easily controlled—will not only do the needful for Mr. Hyatt, but this motive would otherwise be employed, and he might count on a large reward, in money and praise.

There is one fact which, if ever noticed before, has not received sufficient attention. When a bird starts to fly, he bends his legs then springs into the air. This spring is a very necessary part of his flight. It gives a momentum to his body such as a stone receives from a sling. The stone has no other force applied, yet it moves far away in the air till it falls to the ground. Why does not the bird come down also? Simply because the little additional force supplied by the wings prevents that loss in the momentum which we see in the stone, and which is caused by its gravity and the resistance of the air. Geese have to run a long distance, with flapping wings, before they acquire a sufficient impulse to enable them to fly. Then, when high up, they may, like the hawk, by a little downward inclination and outstretched wings, acquire an occasional impetus of the body, so as to keep them long floating in the air, with but little or no motion of the wings; or swoop downward and then upward, under this sole impulse, with wings motionless. We are thus taught that it is not actually necessary for us to have a wing or blower power in a flying machine, sufficient to raise its weight bodily from a state of rest; it may otherwise get its starting impetus; and the wing or blowers may then keep up that impetus for continued flight. The car should have springs under it to prevent its coming to the ground too abruptly, and it should be so formed as to rest on the water as well as on the land.

There is a great want of the right kind of knowledge on this subject. Much thought and ingenuity has been applied to it; still the object seems so difficult of attainment that individuals fear to spend their time and money upon it. It is worthy of a more combined and systematic effort, however, on the part of the many who have time and inclination to give it a helping hand; how can that best be done? Could not a society be formed in this city, and elsewhere, having good, responsible and intelligent men-of-science, and of practical skill, for its managers—such men as would make it their business to collect information from all parts of the world in what has thus far been done in every way relating to aerial navigation, and also to disseminate such ideas as would be useful to our inventors? With models, drawings and a library for references—with stated meetings for discussions and suggestions—with corresponding members, and a money fund for ordinary expenses, and for the trial of experiments—and with other united efforts and measures, in furtherance of the cause, much could be done which now seems to be beyond our reach while acting in our own individual capacities. Such a society would also create a more general and lively interest in the subject, and give it a dignity which, though well-deserved, it has not heretofore acquired.

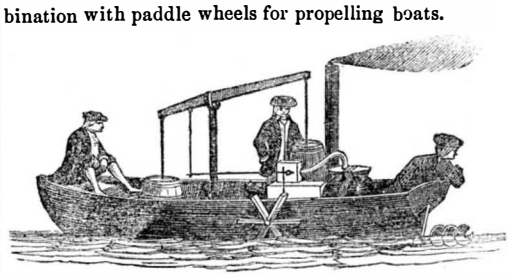
Now what say others to the institution of a "Society for the Promotion of Aerial Navigation?" All men are interested. Who, or what nation, shall have the honor of making the much-needed and the grand discovery of a true and useful "flying machine?" Young America, awake! or others will reap the glory.

W. D. G.

New York, August 13, 1860.

THE GREAT EASTERN—HER PADDLE WHEELS AND SCREW—WHO IS THE INVENTOR?

The public has been somewhat astounded by several notices that have recently appeared in the daily papers, in which it has been stated that measures had been taken to institute a suit for $50,000 dollars damages against the directors of the *Great Eastern*. It has also been stated that the active agents in this movement are Messrs. C. J. Gilbert and S. T. Armstrong, and that the cause of damages is the infringement of the patent granted to James E. Smith, of Greenport, N. Y., on March 14th, 1848. Foreign vessels visiting our ports are not subject to our patent laws, but it is contended by those who are interested in Smith's patent, that the *Great Eastern* has forfeited her foreign character by engaging in the coasting trade, and making excursions for profit. On such a basis the grounds for proceedings against the directors of the great ship appear to be well taken, for assuredly Mr. Smith did obtain the patent referred to for the combination of a propeller and paddle wheels. If it can be proved, however, that Mr. Smith is not the *first* inventor of such a combination of propelling devices, then his patent will become void. In our opinion, good evidence can be adduced to prove that John Fitch, the first American inventor of steamboats, was also the original inventor of the screw and its combination with paddle wheels for propelling boats.



The accompanying engraving represents a boat which John Fitch fitted up with a rude steam engine in 1796 or 1797, and which was propelled on several occasions with screw and paddle wheels on the Collect Pond, a sheet of deep water, which once occupied the place where the New York Tombs and other buildings in that vicinity now stand. The cut is copied from the second volume of the Documentary History of New York, and was formerly published by us on page 104, Vol. V. (old series), SCIENTIFIC AMERICAN. It was transferred, with an amendment by the historian, from a rare chart which was published in 1846, by John Hutchins, of Wesley Place, Williamsburgh, L. I. Two of the persons in the illustration represent Robert Fulton and Chancellor Livingston; John Fitch is shown attending the machinery, and John Hutchings (then a lad between fifteen and sixteen years of age) acting as steersman with an oar. John Fitch could only obtain a big iron kettle for a steam boiler, and his mechanism was very rude; still, the boat was run at the rate of six miles per hour. The chart of Mr. Hutchings was designed from memory, and published two years before Mr. Smith's patent was granted. It contains two cuts of the same boat, the one having the screw and the other the paddle wheels, which were both used, but not shown combined as in the Documentary History. A line of print at the bottom of the chart, however, states that the screw and paddle wheels were both employed on the boat. Mr. John Hutchings is now more than 80 years of age, and is probably the only man living who saw John Fitch's boat running on the Collect Pond. He is still quite vigorous, and possesses a good memory. He lives in comfort, but with untiring industry he still works daily at the bench as a cooper; and a few days since we derived from his own lips an account of his early steamboat trips and remarkable experience. In 1796 he steered the 17-feet boat here represented, which was the only one then in existence in the world. But 64 years have passed away since then, and what a change to the *Great Eastern*—692 feet in length, 83 feet in width, and 60 feet in depth!

We have always claimed the screw propeller as an American invention, also the combination of the paddle wheels and screw in one vessel as the invention of John Fitch. Were this not the case, we could not have claimed this mode of propulsion for America by basing our proof on Mr. Smith's patent. The English claim that, in 1842, a steamer, named the *Bee*, belonging to Portsmouth, was fitted up with both paddle wheels and screw propeller, which could all be connected and driven with the same engines. This is stated in Tredgold's work on the Steam Engine, and mentioned on page 333, Vol. IV., of the English Patent Abridgements, under the head of "Marine Propulsion." We have given a simple narration of the facts relating to this case, so that the public may be made fully acquainted with all its merits, as the statements hitherto published respecting it have been very unsatisfactory. We do not envy the spirit of those men who have exhumed a musty patent which had never been applied practically and usefully by its owners, for the purpose of harassing the directors of the noblest specimen of naval architecture and enterprise the world has ever seen. Whatever may have been the shortcomings of the managers of the *Great Eastren*, our people will not tolerate any unjust or ungenerous act towards them; for meanness is no part of *our* national character.

AGRICULTURAL FAIRS FOR 1860.

Alabama	Montgomery	October 29 to Nov. 2.
Cotton Planters' Convention	Macon, Ga	December 3—20.
Georgia	Atlanta	October 23—26.
Illinois	Jacksonville	September 11—14.
Indiana	Indianapolis	October 15—20.
Iowa	Iowa City	October 2—5.
Kentucky	BowlingGreen.	September 18—22.
Mississippi	Jackson	November 6—9.
Missouri	St. Louis	October 24—27.
New Hampshire	Manchester	October 2—4.
New York	Elmira	October 2—5.
Ohio	Dayton	September 25—28.
Pennsylvania	Wyoming	September 24—27.
South Carolina	Columbia	November 13—16.
Tennessee	Nashville	September 10—16.
U. S. Agricultural Society	Cincinnati, O.	September 12—20.
Vermont	Burlington	September 11—14.
Wisconsin	Madison	September 24—27.

AMONG other uses to which glycerine is now put, is that for the solution of gum arabic and albumen or white of eggs. Slightly diluted glycerine, when heated to 110° or 120° Fah., dissolves large quantities of the gum; and when diluted with an equal volume of water and heated to about 100° Fah., it dissolves albumen almost in any proportion, both of which solutions will keep for a long time, even in summer, without a change.

Boiling water will dissolve a small quantity of powdered glass. According to experiments which have been made, the quantity of glass thus dissolved amounts to about .002 per cent of the water. In the solid state, neither water or the common acids act upon glass.

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THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

We continue, this week, our extracts from the most important papers read before the members of the above association:—

Fossil Foot-marks.—President Hitchcock, of Amherst College, exhibited diagrams of some gigantic foot-marks, which, he said, had now been discovered in nearly all the formations of the fossil-bearing rocks, although they were first discovered about 30 or 40 years ago. He proposed that all animals known only by their tracks, be placed in a family to be called Lithichnozoe. There was a very common source of error in mistaking the print of the hind foot of an animal for that of the fore foot, when superposed. It was often supposed too apparently that bipedal tracks were made by quadrupeds, the tracks of the fore feet being obliterated by the tracks of the hind feet. He had specimens in which the deeper track of the smaller fore foot was plainly seen under the large track of the hind foot, but there were only two or three tracks of the fore feet, to 30 or 40 of the hind feet, which showed that the animal rarely brought its fore feet to the ground. This should make geologists careful about concluding that tracks apparently made by birds were not made by quadrupeds. The trace of a tail was not a sure indication that the tracks were made by a reptile, for he had learned that the opossum left the trace of its naked tail on soft ground, and that by this it was known.

Professor Agassiz said that he had long ago expressed his disagreement with some of these conclusions; he did not believe that the method pursued would lead to satisfactory results in the end. The first thing to do was to inquire what were the animals living in these or corresponding deposits. We had many deposits of bones in rocks of similar age, and we should try to ascertain how far the animals known to have lived in this age could have been the animals which made those tracks. Many animals were already known to have lived in these times. He thought that a comparison of these tracks with the probable tracks which they would have made, would lead to some substantial results; but until that method should be introduced into the investigation, he did not believe in the results.

Professor Rogers fully agreed with Professor Agassiz as to the proper method of investigation; he was quite sure that no trustworthy results could be obtained until that method should be adopted.

Rhode Island Coal.—A paper was read on this subject by Charles H. Hitchcock, of Amherst, Mass. He attempted to show that the coal basin of Rhode Island belonged to the oldest of the coal periods.

Professor Agassiz said that when we saw the deposits of peat in Massachusetts, and of wood in the swamps of the South, and how different they were, and that they might both one day be turned into coal, we should not conclude that two basins of coal in different latitudes were of different ages because they differed in lithological character or in fossils; we saw how different the animals growing in these swamps and bogs were now. He was prepared to show that deposits formed in or near periods might not contain a single identical fossil, and that, therefore, our present criterion of synchronism from identical fossils, lacked one element of certainty. Nor was it necessary that deposits should be very thick to represent a long period. Since the creation of man, there had been but 60 or 70 feet of coal reef formed in the Floridas, and the carboniferous period might contain innumerable epochs. He thought that as yet our facts were not sufficiently numerous to authorize us to draw any very definite conclusions.

Binocular Vision.—Professor Rogers read a paper on this subject, and took the ground that Sir David Brewster's explanation of seeing the solid picture in a stereoscope, is wrong. Professor Rogers asserted that the process of the stereoscope in one of the association of ideas with previous sight; and ordinary vision is partly a process of association with remembrances of the ideas received through touch. In short that it is a neutral process. Most of the members of the association seemed to agree with this explanation.

Hindoo Astronomy.—Professor W. D. Whitney of New Haven, read a paper on the data and method of the Hindoo Astronomy. He thought it a perfectly settled point that the Hindoos derived their astronomy entirely from the Greeks at a period not earlier than the first centuries of the Christian era. But they Indianized the science, and claimed for it an exaggerated antiquity in their own nature. The very admixture of nonsense and truth betrays the action of two sets of minds—the Greeks supplied the science and the Hindoos the fable. They knew that this earth was a sphere, and yet disguised this knowledge with fables of projecting poles. They divided the zodiac into 27 or 28 lunar mansions, a natural division, of unsettled origin; some thinking it Chinese, but possibly originating in Central Asia. They also used the lunisolar division into 12 signs. The precession of the equinoxes was recognized, and the amount was stated with considerable accuracy. The planets supposed to revolve about the earth were named mythologically.

Combustion of Wet Fuel in Furnaces.—Professor Silliman then read a paper in which he stated that until a recent period the combustion of such material was uneconomical from the loss of heat rendered latent in the evaporation. But a new form of furnace enables us to use the vapor from the fuel, to feed the fire instead of air, and to burn the hydrogen thus set free, in a new fire above the original fire. This invention has proved of very great value in the burning of the crushed cane on a sugar plantation, He had himself burned in a furnace, New England peat containing 75 per cent of water. It was strange that such familiar chemical truths should have so long been without a practical application such as now has been made, of such high economical value.

Professors Wolcott Gibbs and E. N. Horsford made some remarks on the theoretical saving of heat in these furnaces. The peculiarity of the furnace lies in the cutting-off of atmospheric air.

Vermont Geology—Darwinism Repudiated.—President Hitchcock then gave a description of some brecciated trachytic dykes in Shelbourne, Vt., with special reference to their temperature when formed. He supposed the fragments composing the breccia to have been washed in by the water of an ocean, then to be heated to nearly 1,000°, which would cement the breccia.

Professor Agassiz asked how there could be any ocean which would wash pebbles into such heated spots.

President Hitchcock said that he made the suggestion only because it was the best he had.

Professor Agassiz thought naturalists should proceed with the same care and exactness in their reasoning which was used in mathematics. They should be as careful in making their hypotheses. Until then we should have those wild theories of spontaneous generation, Darwinism and the like, which now were the disgrace of science.

Tripoli or Polishing Powder.—Dr. J. G. Morris read a paper by Dr. C. Johnson, of Baltimore, on a very fine tripoli found in Nottingham, Calver county, Md. The paper was short, consisting principally of a list of the shells composing it, and the opinions of several gentlemen to whom he had submitted specimens of this diatomaceous earth.

Professor Agassiz asked if there were any samples of this earth present.

Dr. Morris said that Mr. Tyson would furnish them.

Professor W. B. Rogers said that he had found considerable beds of this in Virginia and North Carolina, and generally in connection with fossils which were clearly referable to the Meiocene. He thought that this would be found to be at the base of the Meiocene. It was very interesting to trace these deposits for so great a distance along what might be supposed to be an ancient seaboard.

Atmospheric Phenomena—Lightning Storms.—Professor Henry delivered an interesting lecture on this topic. He commenced by recalling to remembrance some familiar truths. The prevailing winds in the United States are westerly, especially in the higher currents. The general principles of the Espyan theory of storms may be considered established, namely, that a storm arises from a lower stratum of air becoming moist and warm, and rising by specific levity to or through the upper current, by which it is carried easterly. The condensation of the moisture produces heat and keeps up the upward motion, so that a fresh supply of the warmed stratum below keeps rising for an indefinite period. Many of the storm which pass out on the Atlantic started at the very bases of the Rocky Mountains. But our summer thunder showers arise anywhere—sometimes many simultaneously spring into existence over large tracts of the country. They usually all move easterly. These thunder-showers are sometimes very local in their action, the whole disturbance being sometimes of less than half-a-mile in altitude, and over a few miles of area. Professor Henry was satisfied that while Espy's general views were correct, yet Dr. Hare was also right in saying that electricity plays an important part in storms; and Redfield, in saying that storms sometimes rotate. As to the source of the electricity in the air, he showed that it was not the friction of the winds on the earth, nor vegetation, nor evaporation, but that it was still unknown—unless we adopt Peltier's hypotheses, that the earth is a great negatively electrified, insulated conductive, and the air is electrified by induction. This will account for all the phenomena, and it has not yet received from scientific men the consideration it deserves.

The facts which show the correctness of this hypotheses are such as this, that a long insulated conductor showing no signs of electricity, will show them the instant that one end is brought nearer to the earth than the other. The lower end then becomes positive, the upper negative. Now the column of rising vapor in a storm is a partial conductor, in the right position to be thus electrified by induction from the earth. When, as in a thunder-storm, the vapor is dense the quantity of electricity is sufficient to produce disruptive discharges; but these discharges produce only a temporary relief to the tension since the column of vapor is continually renewed and electrified afresh by induction. A thunder-storm consists usually of two clouds, one above and one below, between which flashes of lightning play, and this explains, to those who know that a point can receive a spark from a double conductor, how the lightning rods, even of a city, are often struck and their points melted.

THE HANGING OF MILL SAWS.

MESSRS. EDITORS:—On page 66 of the present volume of the SCIENTIFIC AMERICAN, I notice an article on the adjustment of mill saws, written for the guidance of young sawyers, and also for the purpose of drawing out from mill men their views. I take the liberty to make exception to one point, which is an important one in the cutting of lumber. Your correspondent gives, as a rule, an overhang of $\frac{3}{4}$ inch to the saw. Now suppose some young sawyer takes that for his guide and is sawing hard white oak, and the feed of the log is $\frac{1}{8}$ inch, it is evident that the saw will be $\frac{5}{8}$ inch from the wood to be cut, when it is up and ready to commence its downward or cutting stroke. The result is that the saw descends nearly 5-6ths of its stroke before it commences to cut; then, on its up-stroke, it is drawn so completely clear of the wood that the sawdust is nearly all left in the cut. I ask sawyers (young or old) if this is right? Again, suppose the feed to be 1 inch (which is not uncommon) and the overhang, as before, to be $\frac{3}{4}$ inch, how is the log to be moved up the last $\frac{1}{4}$ inch, unless the saw cuts on its upward stroke? I give as a rule that the overhang of mill saws should be a trifle more than the feed of the log, say if the feed is $\frac{1}{4}$ inch, let the overhang be 5-16ths of an inch; this will keep the teeth so close to the wood, on the upward stroke of the saw, that all the sawdust remaining in the log at the time of the termination of the down stroke will be carried up and out of the cut, and as the saw commences its down stroke it immediately commences cutting, which it continues through its entire descent. The stirrups should be so made that the overhang may be suited to the work to be done, the feed varying from 1-16th to 1 inch. If I am not right, let those experienced in these matters give me light on the subject.

GEORGE H. REYNOLDS.

Greenpoint, L. I., Aug. 6, 1860.

THE GREATEST SAWING FEAT.

MESSRS. EDITORS:—I have seen notices in the SCIENTIFIC AMERICAN of fast sawing. I will state what I have done in my mill; perhaps you may deem it worthy of notice.

On Thursday, Aug. 2d, we sawed with one circular saw, in ten hours, thirty four thousand six hundred and seventy-three (34,673) feet of lumber, one inch in thickness, and all done in a workmanlike manner. The number of logs sawed was one hundred and twenty (120).

My mill is driven by steam; the engine is of 10-inch bore and 20-inch stroke, with three cylinder boilers, 2 feet in diameter by 30 feet long. We use sawdust for fuel.

W. VAN NAME.

Cedar Run, Pa., Aug. 3, 1860.

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JOURNAL OF PATENT LAW.

HOW FAR A NEW PRINCIPLE IS PATENTABLE—TATHAM'S PATENT FOR MAKING LEAD OR TIN PIPES.

A very interesting case is reported in the last volume of reports of the United States Supreme Court. The case arose from an alleged infringement of the Tatham's patent, for an improvement upon the machinery used for making pipes and tubes from lead or tin, when in a "set" or solid state. That part of the case which we think of interest to our readers is that wherein the court discuss the question as to how far the discovery and application of a new principle, or natural agency, is deemed to be patentable; and we will therefore state only so much of the case as will serve to throw light upon this question.

At the trial a great number of facts were proved, showing the successful manufacture of lead in the mode stated in the specification; and particularly that pipes thus made were found to possess great solidity and unusual strength, and a fine uniformity of thickness and accuracy was arrived at, such as, it is believed, had never been attained by any other machinery. And the essential difference claimed in the character of this pipe which distinguished it from all others heretofore known or attempted, was, that it was wrought under heat, by pressure and constriction, from "set" metal, and that it was not a casting formed in a mold.

It was also proved that lead, when recently become set, and while under heat and extreme pressure in a close vessel, would re-unite perfectly after a separation of its parts. This we understand to be the principle at the base of the Tatham's patent.

But a patent cannot be taken out solely for an abstract principle; for any law of nature, or for any property of matter, apart from a definite mode of turning it to account. A mere discovery of such a principle is not an invention, in the patent law sense of the term. The distinction between a patent for a principle and a patent which can be supported is, that you must have an *embodiment* of the principle in some practical mode (described in the specification) of carrying it into actual effect: and then you take out your patent, not for the principle, but for the *mode* of carrying the principle into effect. (Websters's Cases, 342, 683.)

The portion of the opinion of the court bearing upon the subject we have under consideration is as follows:—"However brilliant the discovery of the new principle may be, to make it useful it must be applied to some practical purpose. Short of this no patent can be granted. And it would not seem to be a work of much labor for a man of ingenuity to describe what he has invented. The newly-discovered property in the metal, and the practical adaptation of it by these means to the production of a new result, namely, the manufacture of wrought pipe out of solid lead, was the discovery. There can be no patent for a principle; but for a principle so far embodied and connected with corporeal substances as to be in a condition to act and produce effects in any trade, mystery, or manual occupation, there may be a patent. The principle may be the new and valuable discovery, but the practical application of it to some useful purpose is the test of its value."

In the case of Leroy *vs.* Tatham, it was said:—"In the view taken by the court in the construction of the patent, it was not material whether the mere combination of machinery referred to was similar to the combination used by the Hansons, because the originality did not consist in the novelty in the machinery, but in bringing a newly-discovered principle into practical application, by which a useful article is produced, and wrought pipe made, as distinguished from cast pipe."

Now, it must be observed, that the machinery used was admitted to be old, and any difference in form and strength must arise from the mode of manufacturing the pipes. The new property in the metal claimed to have been discovered by the patentees belongs to the process of manufacture. The result is before us. We see the manufactured article, and are told that its substance is greatly modified and improved; but we derive little or no knowledge from inspecting it. Except by the known process of its formation we cannot appreciate its value, or comprehend the various purposes for which it was made. We want to see and understand the processes by which it was formed—the machinery in action, and a full explanation of its parts.

The claimants say:—"We wish it to be understood that we do not confine ourselves to the mode of operation herein described, by making the cylinder rise with the hydraulic ram and other parts, and keeping the piston stationary, as the same effect will take place when the cylinder is stationary, and the power of the ram is applied to the top of the piston to cause it to descend into the cylinder, and our improvements might be applied to a cylinder and press, fitted up in other respects upon Burr's plans, whereby the pipe is received over the top of the machinery, &c.; all which and other variations will readily suggest themselves to any practical engineer, without departing from the substantial originality of our invention. The combination of the following parts above described is claimed, to wit: the cone and bridge or guide-piece, with the cylinder, the piston, the chamber, and the die, when used to form pipes of metal under heat and pressure, in the manner set forth, or in any other mode substantially the same."

To the above is added: "We do not claim as our invention any of the parts of the above described machinery, independently of their arrangement and combination above set forth."

The machinery described in both the above sentences is only claimed when used to form pipes of metal under heat and pressure. And it must be admitted that the machinery described and illustrated by the drawings is sufficiently explicit to show the nature of the invention. If it be admitted that the machinery, or a part of it, was not new when used to produce the new product, still it was so combined and modified as to produce new results, within the patent law. One new and operative agency in the production of the desired result would give novelty to the entire combination.

The specifications are drawn with care and no ordinary skill, and they cannot be misunderstood. No one can be supposed to mistake the new product for the machinery through which it is developed. And in regard to a practical application of the new conception, it is as necessary as the conception itself; and *they must unite in the patent.* The apparatus described is properly regarded by the patentees as subordinate, and as important only as enabling them to give practical effect to the newly-discovered property, by which they produce the new manufacture.

After some further discussion of the subject, and a statement of the essential parts of the patent under consideration (which we deem unnecessary to give), the court concludes as follows: "It is rare that so clear and satisfactory an explanation is given to the machinery which performs the important functions above specified. We are satisfied that the patent is sustainable, and that the complainants are entitled to the relief claimed."

WORKING STEAM EXPANSIVELY.

MESSRS. EDITORS:—The statements that have appeared in various papers in regard to the experiments at Messrs. Hecker & Brother's flour mills have, as might be expected, caused some talk among those who have made the steam engine their study. One article, headed "The Fallacy of Cut-offs," tells the world that to work steam expansively requires 10 per cent. more coal than to follow full stroke. Now, this is worthy the attention of those who are using cut-offs, as well as of those about buying engines with cut-offs; also of the builders of engines. I, for one, am still foolish enough to believe in working steam expansively, and shall continue to think so unless I have more proof to the contrary than has as yet been produced. Yours, most respectfully,

GEO. H. REYNOLDS.

Greenpoint, L. I., July 30, 1860.

[We agree with our correspondent fully.—EDS.

AN INVENTION CALLED FOR.

MESSRS. EDITORS:—I wish to call attention of the inventors of our country, through your invaluable journal, to a want which is felt, I believe, very generally. It is a well-known fact that screw propellers are a great auxiliary to sails; what is wanted to render them available for that purpose is a simple and reliable way to fasten the blades from the inside of the vessel; the same to answer for altering the pitch of the screw, which is very necessary in variable or adverse winds. This suggestion may have been acted upon before, but I believe not in a manner which is at once reliable and simple.

J. W. C.

Sugar Island, Mich., July 30, 1860.

MILLWRIGHTING AND MILLING—DRESSING STONES.

We have frequently stated to our readers that there is a great variety of opinions and practices existing among millwrights; and the following letter corroborates these statements in a most positive manner:—

MESSRS. EDITORS:—On page 307, Vol. II., SCIENTIFIC AMERICAN, there is published the letter of a correspondent in Baltimore, who states he has had practical experience in millwrighting and milling, and another, on page 371, from a correspondent of the same profession. Now, if we compare those two letters, we find there is quite a difference of opinion as to the speed of the stone. W. M. (page 307) runs his burrs at 100 revolutions per minute, while J. B.'s experience (page 371) teaches him that 160 revolutions per minute is the right speed. For this difference of opinion in two practical mechanics it is perhaps difficult for some to account, As I have also had some experience in millwrighting and milling, I will therefore offer a very few remarks. The fact that there is a great difference of opinion in the art of milling, even amongst the best of millers, goes to show a want of judgment in the business. One man builds his mill to run at a certain velocity, and it does well; another, thinking all is in the speed, runs his mill at the same speed, and he cannot get it to work well. The reason of this is, perhaps, the dress or draft in the furrows of his burrs—they do not suit his speed. On the other hand, we find a miller hunting over the country for some renowned pattern, and when he gets it, it is ten to one if the speed of his mill suits it. The dress must be made to suit the speed of the stone, or it is impossible for it to work well, and by observing this rule, a stone can be made to work well at any speed from 100 to 200 revolutions per minute, according to the kind of work the mill is to do.

I would here remark that none but a man of undoubted experience and capability should be allowed to put the dress on a millstone; there are hundreds of mills that are very deficient in this respect; and when we examine a miller's accounts, and find that one or two lbs. of flour to the bushel make his profits or loss, we see more clearly the necessity of having the stone prepared in the best manner for grinding.

WM. J. MCMASTER.

Sewickleyville, Pa., July 31, 1860.

THE "SCIENTIFIC AMERICAN" IN GERMANY.

The following letter contains hints which will be interesting to many of our readers:—

MESSRS. EDITORS:—We are glad to assure you that the new series of the SCIENTIFIC AMERICAN continues to exhibit a great improvement—in shape, type and contents—upon the old form of your most valuable journal, which we call "the record of American genius, and from which we constantly extract articles of most valuable and interesting material, both for our use as machinists, and for our own journal—the *Plow*—which is published under the auspices of our partner, Mr. J. Pintus. Perhaps the following case will be of interest to you.

From reading your list of patent claims, some years ago, and afterwards some of your remarks on American mowing machines, we published extracts of what was going on in that business in your country. The universal interest taken in those communications induced us to import one of those American mowing machines into Germany, where we had it in public during an agricultural fair arranged by our Agricultural Academy, and in the presence of your ambassador at the court of Berlin (his Excellency Governor Wright), who takes the greatest interest in all agricultural matters in Germany. It was the first *mowing* machine ever seen in Germany, only reapers being known before; and, on the second trial, some days afterward, it obtained the great gold prize medal at Gusdrow, Mecklenburg. It was a machine invented by Mr. Wood, of Hoosick Falls, N. Y., and proved itself of excellent efficiency and workmanship.

American machines are much more adapted for German use than English ones, as the conditions in both countries are more alike; we shall be happy if we can assist American inventors in the introduction of agricultural machines into Germany.

PINTUS & Co.

Berlin, Prussia, July 23, 1860.

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AMERICAN NAVAL ARCHITECTURE.

THE STEAMER "BIENVILLE."

This steamer was constructed for the New York and New Orleans Steamship Company, to run between these ports *via* Havana. The following are her dimensions:—Length on deck from fore-part of stem to after-part of stern-post, above the spar deck, 254 feet; breadth of beam at midship section, above the main wales (molded), 38 feet 8 inches; depth of hold, 19 feet 5 inches; depth of hold to spar deck, 26 feet 9 inches; draft of water at load line, 15 feet; area of immersed section at load draft, as above, 530 square feet; tunnage, 1,600 tuns. Her hull is of white oak, chestnut, hacmetac, &c., and very securely fastened with copper and treenails. Distance of frames apart at centers, 18 inches. The floors are molded 16 inches; sided 14 inches. The frames are fitted in solid, and diagonally and double laid with iron straps 4 inches by $\frac{5}{8}$ of an inch in diameter. The depth of the keel is 10 inches.

The *Bienville* is fitted with one vertical beam condensing engine; diameter of cylinder, 65 inches; length of stroke of piston, 11 feet; diameter of paddle-wheels over boards, 30 feet; material of same, iron; length of boards, 11 feet; depth, 1 foot 6 inches, and are 26 in number. She is also supplied with two return flue boilers, whose length are 27 feet; breadth 12 feet; hight, exclusive of steam-chests, 10 feet; location in hold.

Number of furnaces, 6; breadth of these, 38 inches and 44 inches; length of grate bars, 7 feet 6 inches; number of flues in boilers, 36; internal diameter of same, 8, 10, 11, 12, 13, and 16 inches, and their lengths are respectively, 13 feet 3 inches, and 19 feet 6 inches.

The hight of smoke pipe above grate surface, is 32 feet; its diameter is 6 feet 6 inches. The load on safety valve in pounds, per square inch, is 20 pounds; maximum revolutions, 18.

Her rig is that of a brig. She has two athwartship bulkheads, and two cargo or loading ports on lower deck forward. The bunkers are of wood; does not use blowers, and possesses one independent steam fire and bilge pump, one bilge injection, and bottom valves or cocks to all openings in her bottom.

In addition to the foregoing features, she is amply protected from communicating fire from boilers, &c., by felt, iron, tin, &c.

The builders of the hull are Messrs. Lawrence & Foulkes, of Williamsburg, L. I.; the machinery was contructed by the Morgan Iron Works, this city.

PROSPERITY AND GRATITUDE OF GENIUS.

At the present time there appears to be an extraordinary demand for all kinds of patent property; and, as a natural consequence, patentees are proportionatelv elated at their present or prospective prosperity, and dozens of successful inventors, who have had their cases prepared at the Scientific American Patent Agency, are daily sending us letters gratefully acknowledging the value of our services. We append a few of these testimonials, as samples of a success which is calculated to foster the spirit of progress among our tens of thousands of inventive readers, and incite them to mechanical and other achievements greater than any hitherto chronicled in the records of the Patent Office:—

MESSRS. MUNN & CO.:—I am in receipt of my Letters Patent, and I am well-pleased with the work throughout. I have sold territory to the amount of $1,200. Yours, with respect,

J. N. RANKIN.

Middletown, Iowa, June 18, 1860.

MESSRS. MUNN & CO.—*Dear Sirs:*—My Letters Patent arrived to-day. Please accept my thanks for the prompt and handsome manner in which my affair has been managed. I hope to realize something from it. I have your circular, and am trying to form a club for the SCIENTIFIC AMERICAN, but this is mostly a farming community, and they, as a class, do not feel like taking a scientific paper. Yours, truly,

H. M. WALKER.

Watertown, Conn., June 20, 1860.

MESSRS. MUNN & CO.—*Gents.:*—I am happy to inform you that I am likely to realize a fortune from my combined vise and saw-set. I have an agent who has sold rights for the New England States amounting to over $6,000, or more than $1,000 a State; and if all the States in the Union were sold at that rate, the sum must amount to at least $25,000. I shall want you to do some more business for me before long. Yours, &c.,

NORMAN ALLEN.

Unionville, Conn., June 23, 1860.

[See engraving of this invention on page 148, Vol. II. (new series), SCIENTIFIC AMERICAN.]

MESSRS. MUNN & CO.:—I only write to say that your prompt and efficient attention to the business entrusted to you has given me entire satisfaction, and I will take pleasure in the future (as also in the past) in recommending your Patent Agency and that valuable paper, the SCIENTIFIC AMERICAN, whenever opportunity occurs. Respectfully yours,

SAMUEL BARNETT.

Washington, Ga., July 14, 1860.

MESSRS. MUNN & CO.:—I have just received my Letters Patent, the issue of which you had previously announced to me by mail. I am very much obliged and thankful for the manner in which you have brought my claims to a satisfactory conclusion. I have felt considerable anxiety about the success of the application; my residence being so far distant, and our mails here being very unreliable, letters being sometimes detained nearly three weeks on their way to New York. If I should have any other application, I shall certainly apply to you, and shall also take pleasure in recommending your firm to my friends. Please let me know, by next mail, what you will charge me for engraving and publishing my invention in the SCIENTIFIC AMERICAN, and furnishing 400 copies of that very valuable journal, as the distribution of such copies among sugar-planters would certainly be of immense advantage to me. Yours, respectfully,

J. J. UNBEHAGEN.

Baton Rouge, La., July 20, 1860.

MESSRS. MUNN & CO.:—I have just received from you the satisfactory intelligence that my patent is "put through" at Washington. I have been chagrined at hearing from some persons that my patent would not be granted without further fees; and that some other persons would have done it better, and in a shorter time; and the next news I would get would be "some difficulty, and more money wanted." Now, I can prove the falsity of such assertions. I would have inclosed a year's subscription to your valuable SCIENTIFIC AMERICAN, but I intend to exert myself to get up a *club* for it, and there would be better chance for getting one up after harvest. I have got another invention and you will soon hear from me again. At present, it is due to you for me to say that I have never had business done more promptly or satisfactorily. Very respectfully,

J. C. RAINBOW.

New Brighton, Pa., July 26, 1860.

MM. MUNN & CIE.:—J'ai regu votre charmante lettre par laquelle vous m'annoncez que mon brevet d'invention m'a eté accordé à Washington.

Veuillez recevoir mes remerciments pour les souhaits que vous me faites et pour la célérité avec laquelle vous avez agi dans mon affaire.

Il est certain qu'on ne peut rencontrer nulle part une agence pour brevets instituée sur des bases plus larges et plus solides.

Quant à votre journal, auquel je suis resté constamment abonné depuis quelques années, je me plais à avouer que c'est un des journaux scientifiques qui m'ont le plus interessé, et qu'il est vraiment digne du patronage que vous avez su lui faire acquérir.

Veuillez me croire votre devoué serviteur.

F. DE COMPOLORO.

New York, le 31 Juillet, 1860.

MESSRS. MUNN & CO.:—In your inestimable publication, exclusive of the valuable information which it constantly conveys to the studious mind, I often find remarks which—to use a plain expression—"hit the nail on the head." I now find, on page 71 of the present volume, these lines:—"The greatest discoveries have been made in leaving the beaten tracks of science and going into the by-paths. Let inventors mark this sentiment well." Permit me to say that, in my opinion, there are many, like myself, who will consider that the above sentiment is the truth well spoken in a few words.

JOHN H. MARTINSTEIN.

New Orleans, La., July 31, 1860.

[Mr. Martinstein is one of those faithful friends who are ever on the alert to serve somebody. For many years he has made up a large club in New Orleans, and sent us the list without compensation for his services. He is one of the many who think that they serve their friends by recommending the SCIENTIFIC AMERICAN.—EDS.

MESSRS. MUNN & CO.:—I am in receipt of my Letters Patent bearing date June 26th, and need scarcely add I am much pleased with the promptness which you have shown in this as in other business transactions I have had with you, for which accept my best thanks. I only forwarded my claim to you on June 2d. I make this note from the fact that, on a former occasion, some years ago, when I applied for a patent without your aid, and after five months' delay, my claim was rejected on some frivolous ground; I then employed and paid a patent agent in Pittsburgh, and as I felt persuaded my claim was a legitimate and just one, I proceeded to Washington. When in the federal metropolis I was obliged to pay another patent agent, and after considerable time and expense and great inconvenience, I succeeded in establishing my claim, and received a valuable patent. Yours respectfully, JOHN SWEENEY.

Chicago, Ill., July 31, 1860.

MESSRS. MUNN & CO.:—It is with pleasure that I write to inform you that I have received patents for my Pea and Bean Huller and Crane, for which you will please accept my thanks, as I feel under many obligations for the prompt manner in which they were obtained, and shall most cheerfully recommend your agency to any of my friends who may be desirous of obtaining patents. Very respectfully,

JAMES P. SMITH.

Portsmouth, Va., August 2, 1860.

MESSRS. MUNN & CO.:—My Letters Patent came to hand yesterday. I am exceedingly grateful to you for the success you have had in obtaining me a patent on my Rotary Engine. I was surprised at the accuracy of the drawing and the skill of the draughtsman. I am well pleased that I employed you. When I commenced, I thought that I would do my business with the Patent Office myself; but I afterwards considered that I had better employ you to do it, and I find that I acted wisely, for, if I had gone on myself, I would not have got a patent upon the first trial, and probably not at all; but if I *had* got one, it would not have been so definitely set forth in the claims. I shall take pleasure in recommending you as agents. Yours, respectfully,

SAMUEL T. RUSSELL.

Ottawa, Ill., August 3, 1860.

MESSRS. MUNN & CO.:—I received my patent papers all right, and I am very happy to express my thanks to you for doing the business for me right and well in every respect, and I shall recommend all my friends to you when they have any patent business to do. I shall call on you again as soon as I can get time to make a model; I have made some additional improvements. I shall also seek your counsel in regard to the general question of infringements; although no one, as yet, has claimed that I infringe on them, I yet wish to investigate the matter, and if I infringe where I cannot avoid, I desire to make arrangements with the party without trouble.

Yours, &c., J. W. SHIPMAN.

Springfield Center, N. Y., August 4, 1860.

MESSRS. MUNN & CO.:—You will please accept my thanks for the prompt manner in which you attended to my business in the Patent Office. I feel in duty bound to do what I can to extol both your manner of doing patent business and conducting the SCIENTIFIC AMERICAN. I am an old practical tanner (almost 60 years of age), and unable to work as usual by the day or month; but I have had experience of many different modes of tanning, in various parts of the world, and I am familiar with many very important matters that are unknown to other tanners. During a period of 28 years, I have worked in England, Ireland, Scotland, Bengal (India), Cape of Good Hope, France, Lower and Upper Canada and in the United States; and, as a man of truth and soberness, I will willingly *give instructions* in the above art to any person who will address me, inclosing a postage-stamp for return of mail. Your humble servant,

ALEX. HILL.

Dubuque, Iowa, August 5, 1860.

MESSRS. MUNN & CO.:—I return my sincere thanks for the active part you have taken in obtaining the patent for the Excelsior Grain-cleaner in so short a time. I have had full satisfaction from the commencement of our interview until I received my patent papers on July 28th. I expect to soon have another machine ready for your examination. Very respectfully yours,

MATTHEW BARTHOLOMEW.

Fairview, N. Y., Aug. 6, 1860.

MESSRS. MUNN & CO:—Your favor of the 24th inst. is duly received and contents noted, and in reply, allow me at once to return to you my most grateful acknowledgments for the very prompt and energetic manner in which you have conducted my business to a successful termination before the Patent Office. My very feeble health alone has prevented me from having two more cases ready for your prosecution. As to recommending your agency to others, this I can do most heartily, from a thorough conviction of your unbounded facilities and very superior ability to transact business in your line; and as to your invaluable paper, the SCIENTIFIC AMERICAN, I am happy to confess myself its most enthusiastic friend and advocate, and I shall take pleasure in promoting its circulation in this community. As to my invention (the improved Car Coupling), I think you may safely set it down among the "important inventions." One railroad company, that has had it on trial for some weeks, have acknowledged the fact that, if they had used it on their road for the last year, it would have saved them $40,000 in repairs, to say nothing of the loss of life. Congratulating you upon the high position you have attained before the public as patent agents, and the success of your publication, I remain, yours, &c., J. P. MENDENHALL.

Farmington, Ill., July 30, 1860.

P. S.—Have you ever seen a hair from the tail of a horse, when submitted to certain chemical action, become a living creature, possessed with independent organic life, resembling a miniature snake? I may give my observations on this point hereafter.

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PARRISH'S STUMP EXTRACTOR.

It was only last week that we described an apparatus for extracting stumps, and we now present another invention by Nathan Parrish, of an entirely different pattern, being indeed entirely different from any heretofore seen.

It is so plainly illustrated in the engraving as hardly to need any description, the leading idea being to attach both ends of the lever to the stump. The inventor gives the following as suitable dimensions for the several parts:—

Lever, A, 10 feet long, 16 inches wide, tapering in width from the fulcrum which is ⅓ of the distance from end of lever; said lever is made of two 2-inch planks with 1 inch opening between them.

Roller, B, upon which the lever is placed, 2 feet 4 inches long.

Pillow blocks, *c c*, upon which the roller is placed, 1 foot 8 inches long.

Beam, D, 10 feet long, 7 inches wide, and 10 inches thick.

Posts, *e e e e*, 4 inches by 4 inches, 6 feet 8 inches long; shouldered on the beam, 1 foot from the end of beam, D, and 2½ feet apart at the base.

Braces, *f f f f*, 4½ inches by 4½ inches; shouldered on the beam, D; 3 feet from the end and 7½ feet apart at the base.

Runners on base, *g g*, 12 inches wide, 3 inches thick, and 10 feet long.

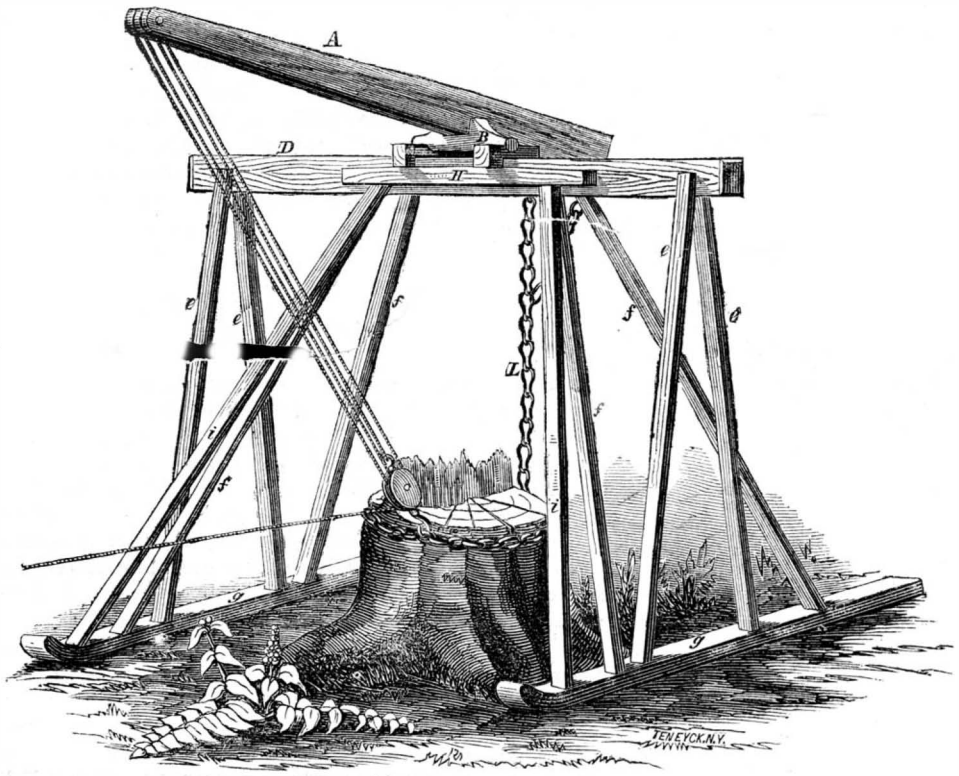
Movable beam, H, 4 inches wide, 6 inches thick, and 4 feet long.

Movable posts, *i i*, 3 inches by 3½ inches, and resting in a loose shoulder near the forward end of runner, G. This "bent" lies back against the beam, D, until the stump is loosened; it is then thrown out under the lever, A, at a point, K, and by loosening the back chain the stump is removed from the bed by the tackles alone.

The runners, G G, are 10 feet apart.

Fig. 3, represents the shape of the grab links in the chain, L

The patent for this invention was granted June 26, 1860; and further information in relation to it may be obtained by addressing Geo. B. Peters, at Galesburgh, Mich., to whom the invention has been assigned.



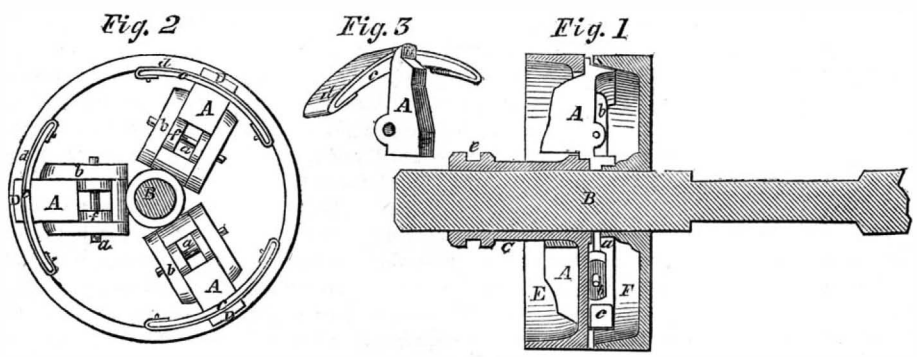
PARRISH'S IMPROVED STUMP-EXTRACTOR.

CHARCOAL FOR THE TEETH.

On page 391, last volume, of the SCIENTIFIC AMERICAN, we published a short extract from the *Dental Cosmos*, in which the employment of charcoal powder for cleaning teeth was condemned by Dr. Blodgett, of Ogdensburgh, N. Y., who recommended the use of soap for such purposes as being a much safer agent. We have received a communication from Dr. Samuel Baker, of Portsmouth, N. H., in which he takes opposite views to those of Dr. Blodgett. He says:—"Charcoal, so far as I have noticed, is a good dentifrice, with the exception of its being smutty to use and leaving a discoloration of the gums when allowed to get between the teeth and the free edge of the gums; but a tooth powder principally of Peruvian bark is equally as good, and is not liable to the above objections." It is an old saying that "doctors differ," and in this case the truth is fully realized. While the one doctor commends soap, the other condemns it, and asserts that its alkaline properties will remove or destroy the teeth, and that it has done so in a legion of cases. We often see it stated that soap is *alkaline in its character*, and injurious to teeth. In a chemical sense, this is not correct; it might just as well be called "greasy in its character," for it is a compound of alkali and some greasy or oily substance.

IMPROVED FRICTION CLUTCH.

The friction clutch having secured the attention of machinists, we seem destined to have a long series of improvements of these devices.



KNICKERBOCKER'S IMPROVED FRICTION CLUTCH.

The clutch illustrated by the annexed cuts consists of two pulleys, F and G, Fig. 2, one fast upon the axle, B, and the other loose, the latter being provided with levers to be forced into the former. One of these levers is represented in Fig. 2, and their position in the loose pulley is shown in Fig. 3. Radial grooves or mortises are cut in the face of the pulley, from the axle to the circumference, to receive the levers, A A A, which levers have the curved segments *b*, upon their ends, as shown in Fig. 2. Wings or projections, *d d*, are made upon the sides of the grooves to receive the pins, *a a*, by which the levers, A A A, are hinged to the loose pulley. The hub, C, of the loose pulley has a groove, *c*, for the reception of a forked lever by which it may be slipped back and forth on the shaft, B. When it is desired to start the loose pulley it is pressed by the lever towards the hollow face of the tight pulley, F, when the segments, *b*, are pressed outward by the straightening of the lever blocks, A A A, thus coming closely in contact with the inner side of the rim of pulley, F, whereby the loose pulley, E, is made to revolve with the pulley, F. Guards, *d*, upon the ends of the lever blocks prevent the latter from falling inwards into the hollow of the pulley, F, and thus bringing the segments, *b*, against its side, when the pulley, E, is slipped back.

The inventor says:—"I dispense with the *thimble* together with all its attachments of screws, springs, toggles, &c., so commonly and I may say universally employed to operate the radial *sliding* clutch, and use only the above-described *vibrating* clutches or impellers, A A A, for the purpose of operating the pulley, E, and shaft, B, giving them such form and suspending them in such manner as to cause them to act promptly and efficiently when in contact, and yet, when desired to stop the machinery, to be easily withdrawn. The simplicity of the construction and the facility of the operation of these clutches or impellers give them the advantage and entitle them to the preference over all others now in use."

The inventor of this clutch is John Knickerbocker, to whom the patent was granted on the 6th of December, 1859. Further information in relation to it may be had by addressing A. S. Rowley, at Hudson, N. Y.

A NEW BRIDGE OVER HARLEM RIVER.—It is proposed to erect a new bridge over Harlem river, near New York, at a cost of $175,000, the main part of which is to be of iron. There are to be four spans and three piers; the two end piers being granite masonry, and the middle one resting on 10 cast-iron cylinders, which support the turn-table of the draw. The span will extend 112 feet, and the draw for vessels will be 80 feet wide, giving, with the width of the piers and abutments, a length of several hundred feet. The road-way will be 28 feet wide, with foot-walks of 8 feet wide on either side.

PRESERVING SHIP TIMBER.—The dry rot in ships is a dreadful and dangerous evil. About three years ago, a fine clipper ship was built in this city for the China trade, and its materials were supposed to be of the best and most durable character; to-day she is perfectly useless with the dry rot. Her timbers, when put in, appeared to be sound; the most practiced eye could not detect rot in them; yet to-day they are almost like punk. The dry rot is a species of slow combustion, and when it appears in one piece of timber in a ship, it spreads throughout all the others, like the action of yeast among a sponge of wheat flour. A single unsound timber in a ship is like the *virus* of small-pox in a human being; it serves to communicate its influence through all the cells of the adjacent timbers. The discovery of some process for treating the timber of our ships prior to using it in vessels, so as to preserve it perfectly, is much desired.

THE London *Builder* gives the following rule for transferring engravings to *white* paper:—"Place the engravings for a few seconds over the vapor of iodine. Dip a slip of white paper in a weak solution of starch, and, when dry, in a weak solution of oil of vitriol. When dry, lay a slip upon the engraving, and place them for a few minutes under the press. The engraving will thus be re-produced in all its delicacy and finish. The iodine has the property of fixing the black parts of the ink upon the engraving, and not on the white." This important discovery is yet in its infancy.

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VOL. III., No. 8.....[NEW SERIES.]....*Sixteenth Year.*

NEW YORK, SATURDAY, AUGUST 18, 1860.

THE ADVANCEMENT OF SCIENCE.

N the heavens above and the earth beneath; in the liquid sea and the fluid atmosphere, we behold boundless fields for scientific investigation. The members of the American Association for the Advancement of Science, are professedly devoted to such pursuits, and they meet annually in public assembly and give an account of their year's labors. Their meeting, this year, (held at Newport, R. I.) has been of a rather interesting character thus far; although, as usual, a great number of useless papers and "vague generalities" have been presented and discussed. This we may always expect; still with all these *draw-backs*, the good which has been done covers a multitude of imperfections. The only way to arrive at correct conclusions in scientific investigation is by carefully conducted experiments and vigilant observations. For several years a series of magnetic observations have been carefully made at the Girard College, Philadelphia, and Professor Bache of the Coast Survey has given a very cautious and carefully prepared paper on the subject. This is of more importance than many persons at *first-sight* may imagine. We depend upon the operations of the magnetic needle for correct surveys of landed property, and for the safe guidance of our ships across the ocean. As the magnet is subject to daily, monthly, and yearly variations, and as it is sometimes affected with sudden irregularities, which extend over the whole globe, and are called *magnetic storms*, we trust that such observations will ultimately lead to a correct knowledge of the laws of terrestrial magnetism.

Professor Henry of the Smithsonian Institute, also read a most useful and practical paper on atmospheric electricity, a subject which he understands, we believe, better than any other person living. He accepts the theory of Franklin, of a single electric fluid, in opposition to that of Du Faye, of a double fluid. He stands on opposite ground from the mass of scientific men in America and Europe, but his position appears to be impregnable. During thunder-storms a portion of the earth is electrically in vacuo, while the thunder cloud above is charged in excess. In order to restore an equilibrium the lightning seeks the earth by the easiest and most direct road, hence the utility of lightning rods made of conducting metal to convey it silently to the ground. Many of these conductors placed on buildings contain spikes along their whole extent, like bristles on the spine of a hog. These are intended to attract the lightning from the atmosphere, but they rather afford facilities for the lightning which enters the apex to pass off laterally and do mischief. Lightning-rods should be round, continuous, and as smooth as possible

Professor Silliman also read a most attractive and practical paper on the burning of wet fuel in peculiar furnaces. The nature of the subject was rather the burning of water in furnaces. The improvement is stated to be the decomposition of steam in furnaces by passing it into an intense fire, then conveying the gases (carbonic oxyd and hydrogen) thus generated into another furnace where they are burned. It is stated that this has been effected with a great economy of fuel, and if this is the case, a total revolution will be the result in manufactures, in land locomotion and ocean navigation. At present we are doubtful of the correctness of the results said to have been obtained, because theoretically, it will take as much heat to decompose water into its elementary gases, as the heat obtained afterwards from the combustion of these gases. Many efforts have been made to burn wet fuel with economy, and to use steam in the furnaces of steam engines, but hitherto without success. We do not say this is impossible; we really hope it is a practical fact.

We have no space to allude to a number of other useful papers which have been read before the American Association, or we should do so with pleasure. Condensed reports of these will be found in other columns of the SCIENTIFIC AMERICAN; and from them it will be acknowledged, with sincere satisfaction, that American science has made considerable advancement during the past year.

THE RIGHTS OF JOINT PATENTEES.

An article on this subject* was published on page 42 of the present volume, but as we have frequent inquiries in relation to other points connected with this subject we shall now reply to them further, *en masse.*

And first, in regard to the right to surrender a patent and obtain a re-issue. This may be done by the patentee or, if he be dead or have assigned his interest in the patent, then by the executors, administrators or assignees. (Act of 1836, §13.)

But suppose he has assigned only a fraction of his interest, or suppose he has assigned one fraction of the whole to one person and the remaining fraction to another. In either of these cases can the holder of such fractional interest in the whole patent (whether he be the patentee or assignee) surrender and re-issue?

That an *assignee* of a fractional interest could not do so we feel very well satisfied. The law only permits this to be done by him when there has been an assignment to him *of the original patent.* This language fairly means *the whole of the original patent.* If the whole is assigned in fractions to different assignees they may doubtless all join and thus obtain a re-issue, but we think they cannot do this separately.

For a reason similar to that given above, we are of the opinion that the patentee may surrender and re-issue unless he has assigned his entire interest. The law gives the patentee this right except in case of his death or of an "assignment made by him of the original patent." A partial assignment would hardly deprive him of this right. On this subject, however, it must be admitted there are grounds of doubt.

At all events, in such cases, the patentee cannot exercise this power to the injury of the assignees. They would at least have the option to hold on upon the original patent if they preferred to do so (see Woodworth *vs.* Stone, 3d Story, 749). In such cases, therefore, different patents of the same invention would be in existence at the same time.

Where the patentee has granted to others entire interests in counties, States, or other districts of country, such a rule would create comparatively little difficulty. The grantee of an entire State or county might, without serious inconvenience, retain the original patent, while in the remaining territory of the United States the reissued and amended patent was in force. But where there are individual interests held by different persons in the same district of country, it would lead to much confusion if these interests were secured by patents differing from each other in some essential particulars. How could they unite in the prosecution of infringers? This consideration casts some doubt upon the correctness of the rule which allows even the patentee to surrender and re-issue while he only retains a fractional interest in the patent. The language of the act, however, seems to justify the conclusion to which we have arrived as above intimated.

Some additional doubt is, however, thrown upon this construction of the law by the provision in relation to disclaimers. The 7th section of the Act of 1837 permits disclaimers to be made by the patentee, his executors, administrators or assigns "whether of the whole or of a sectional interest therein."

The owner of a fractional undivided interest would hardly be permitted to make a disclaimer under this rule. It would only be permitted to one who owned an entire interest in the whole United States or in some section thereof, and not to one of two or more joint owners of the whole or a part.

Now, a disclaimer is in many cases essentially the same in its effects as a re-issue. It produces a substantial change in the original patent, and so far as the rules controlling disclaimers and re-issues are founded simply on reason, they should be the same. The law in the one case has provided for avoiding the inconvenience arising from having the fractional interests in an entire patent heterogeneous in their character. It should, doubtless, have done so in the other. The only doubt is whether this construction can give a tone or meaning to the law different from that which its natural language imports. Some further legislation seems to be required on this subject.

An assignee of an invention may have the patent issued in his own name, but in order that this should be done, it is necessary that he should be the assignee of the entire invention. Unless the inventor has parted with his entire interest, the patent must issue in his own name. This would seem to furnish some reason for the conclusion that he should have the right to surrender and re-issue unless he had parted with his entire interest, for if he had the right to control, to a great extent, the shape of the patent and the nature of the claims before it issues, in opposition to the wishes of his assignees, there seems no good reason to prevent him from changing it afterwards at his own will and pleasure. The better opinion, however, seems to be that after the patent has once issued, the patentee will not be permitted to change it to the injury of other persons interested therein, for which we have the opinion of Judge Story, as is above referred to. We are not aware that there have been any other decisions on the subject. In the absence of such decisions we can only give our opinions with the reasons therefor, which should pass for what they are reasonably worth and no more.

*On the 4th line of the 2d paragraph of that article the word "patentees" should have been "partners."

GOLD—"HO, FOR PIKE'S PEAK!"

[Communicated.]

Any day, from the first shooting of the buffalo grass on the plains to its withering in the frosts of autumn, can be seen miles of canvas-covered wagons with the above inscription upon their covers. "Twenty thousand dollars in gold, per last Denver City express," is the bulletin of the evening paper. Since the first emigrant wagon discharged its freight of picks, shovels, mercury, pans, powder, bacon and hominy, with camp equipage, upon the plains where now stands Denver City, probably not less than two millions of dollars have been raised in the vicinity of this embryo city in a region where the wild Apache hunts the elk, and the trapper, almost as wild as the Indian, pursues his romantic and dangerous occupation. "Yes," says an old-fogy economist, "and for every dollar so raised, two dollars were expended." It may be so, my good friend, and there is many a yard of good broadcloth sold in the New York market for one dollar less than it cost to produce it, and yet the country is richer for the wool made into good broadcloth. So the gold, which was worthless in the quartz, has enriched our country and the world to the extent of two millions by its being taken from the vein and put into the channels of trade and commerce. But we are not about to write an article on political economy: only to give an idea, or try to convey some definite comprehension of Pike's Peak and its surroundings—of its physical aspect and mineral resources—of where it is located, and what are its peculiar and most interesting specialities. Thither our fellow-citizens are bending their footsteps; there the rude camp is pitched, embryo cities are laid out, and the foundations of a future empire are being laid.

Let us spread before us a map of the great Mississippi valley and see if we can, in the first place, obtain some geographical knowledge of the country we seek. From lat. 35° N. to lat. 43° N. and in long. 28° to 31° W. from Washington, stretches a range of mountains in three parallel ridges. Between these ridges lie the most inviting valleys, clothed in perpetual verdure and supplied with the purest waters. From the trapper these valleys have received the name of "parks." From the northern park flow the waters of the northern fork of the Platte river, while the Sweet Water (another branch) comes in from the South Pass to form the Platte river. From the middle park flow the waters of the Rio Grande or the Colorado of the West, emptying its waters into the Gulf of California. In the southern park rise

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the primal springs of the southern fork of the rivers Platte and Arkansas. On the plains of St. Louis, which may be called the south-west park, rise the head streams of the Rio Grande del Nor, of the Gulf of Mexico. These parks are separated from each other by elevated ridges, whose summits are clothed during nine months of the year in snow, inaccessible to the foot of man, and form conspicuous landmarks to guide the traveler over the plains. The ridge between the northern and southern parks is called Long's Peak, and that between the waters of the southern fork and the Arkansas is *Pike's Peak*, while the three elevations southward of this—between the Arkansas, Canadian and Rio del Nor—are the Spanish Peaks. We have now found Pike's Peak, and it is evident that it is one of the spinous processes (to borrow a phrase from our brethren of the medical faculty) of the backbone of the American continent; and when we see the vast forests of timber, the ever-flowing streams from the mountain slopes, the springs that gush cool from their sides, and the vast feeding plains that flank their base, as well as the famous parks, we are convinced that this backbone possesses agricultural capabilities as well as mineral resources to sustain a large and thriving population.

Let us now examine the geology of Pike's Peak. The central *nuclei* and main bulk of the mountains of which Pike's Peak is one of the prominent points is composed of granite. Not, however, the kind of which the Merchants' Exchange and the Astor House are built of, but quite a different affair. It is a porphyritic granite, very rich in feldspar and of a red or purplish-red color. In this granite are veins of quartz, and in the quartz are the lodes and nuggets and strings and flakes and scales of gold, which all have come to seek. Let there be no monopoly—there is enough for all, and for many generations. While much of the gold is easily obtained from the sand or gravels of the streams and water-courses, the main reliable sources are in the mother veins. Much of the gold in the veins is in a form and combination that will be lost to the unskillful and reckless miner. Some of it is still combined with sulphur and in the pyrites or "fool's gold." Some of it is in delicate gold-leaf-like flakes, which will float away as he washes his ground ore, and still more of it is in infinitessimally-disseminated in the gold-bearing rock. Specimens which were thrown away and condemned, as not exhibiting any visible gold, when brought to this city and properly treated, have yielded $200 per tun of 2,000 lbs. We speak, therefore, "by the card." The gold is not all in the granite; this rock, owing to the oxygen in the air acting upon the feldspar, which is an alkaloid mineral, is easily decomposed, and the pyrites, or sulphuret of iron, are also of easy decomposition. The frosts of winter—the thaws of Spring—the rains of summer, all combine to liberate the gold and wash it from its bed in the decomposed rock into the sands and gravels of the streams and deposit it in the *placers*, if indeed there be any true placers there. But the gold may not be altogether in the positions named. It may be that there are on the slopes of the mountains other rocks, like the sedimentary slates of Carolina, which are also auriferous. Emigrants to Pike's Peak pass over, in the State of Missouri, certain limestones and sandstones which contain lead; this lead ore has an appreciable amount of silver combined with it, but not in sufficient quantities to pay for separation. In Arkansas, Old Mexico, Chihuahua, Leon, and other provinces, the limestone becomes a highly-argentiferous rock. In the Organ mountains, in New Mexico, the same thing takes place. Here are the silver mines of Donna Anna, Fort Filmore, Stephenson's, Santa Fe, and other localities. The Organ mountains are but a continuation of the Pike's Peak range; now, as the former range is flanked by silver rocks and the gold-bearing Sierra Nevada are flanked in the east by the silver mines of Washoe, it is quite probable that the argentiferous rocks may yet be found at Pike's Peak. This supposition is the more probable as silver has been found at Taos, southward of the Spanish Peaks. Our mining readers, therefore, should keep a bright look-out for any dark-looking veins that may be found in limestone, sandstone or slate, and even harder rock, as quartz, &c. While miners are lining their buckskin pouches with golden nuggets, they will find silver very comfortable for "small change;" besides silver, in the long run, pays about as well as gold. Moreover, we advise the restless, enterprising spirits that cluster around Pike's Peak not to confine their attentions to this locality, but give *all* the streams rising in these mountains an exploration, as opportunity offers. The richest lodes have not yet been discovered, and the largest nuggets not yet seen. From the South Pass to Santa Fe is a mineral region; why not also the Wind River, the Medicine, the Sweet Water, and the Wasatch ranges?

WRIGHT'S IMPROVED ANIMAL TRAP.

The efficient animal trap here illustrated is so simple that it will be understood by a glance at the engravings.

The spiked board, C, is secured to the base board, A, by hinges, so that it may be turned up in the perpendicular position shown in Fig. 1. It is held in this position by a hook upon the short arm of lever, D, which catches into a wire in the edge of the board provided for that purpose. The lever, D, has its fulcrum in the upright, B, and the end of its long arm is connected with the treadle, F, by the rod, E, which passes through

Fig. 1

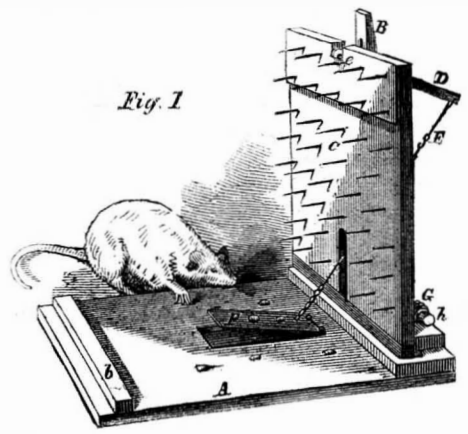
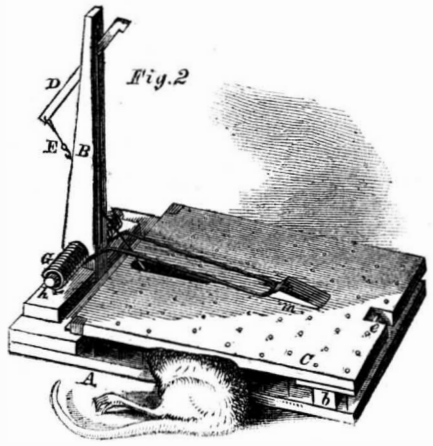


Fig. 2



a slit in the board, C. The bait is placed on the treadle, F, which, it will be seen, acts upon the hook through a compound lever, and thus insures the springing of the trap from the lightest pressure upon the treadle. A wire, G (see Fig. 2), with a spiral spring at each end, presses down the board, C, with proper force, and the end of the loop of this wire catches, as the trap springs, under the projection, *m*; thus preventing the board, C, from being raised, and frustrating any efforts of the caught animal to escape. The projection, *m*, has two or three steps or rectangular notches cut in its edge, so that the loop may catch against it, at whatever hight it is stopped by the body of the animal. A strip, *b*, is secured to the base to receive the blow of the board, C, in case the trap is sprung without any animal in it. The inventor advises the covering of the base and treadle with a cloth before the bait is laid down, in order to conceal these parts from sly and suspicious animals.

The patent for this invention was granted on June 9, 1860; and persons desiring State rights or any further information in relation to the matter will please address the inventor, W. Wright, at No. 1,218 Haines-street, Philadelphia, Pa.

On the 18th of April last, the sun became obscured about noon, in Brazil, although no clouds were visible in the sky. The darkness continued several minutes, and Venus became quite visible to the naked eye. Historians relate that, in 1547 and 1706, like phenomena were witnessed. The cause has been attributed to the passage of clusters of asteroids across the sun's disk.

RECENT AMERICAN INVENTIONS.

The following inventions are among the most useful improvements patented this week. For the claims to these inventions the reader is referred to the official list on another page:—

GOVERNOR.

It is well-known that the time required for each revolution of the balls of the conical pendulum or centrifugal governor is equal to that required for two vibrations of an oscillating pendulum whose length is equal to the distance of the vertex of the cone described by the arms of the governor from the plane of the base whose circumference is described by the plane of revolution of the centers of gravity of the balls. Now in all those governors whose arms are suspended on a pivot whose axis passes through the axis of revolution, the vertex of the cone remains stationary; and as the balls rise, the axis of the cone becomes sensibly shorter by the rising of its base; and in order to raise the balls a given distance, the time of revolution requires to be diminished and the velocity increased in the same ratio as the time of vibration of the proportionately shorter vibrating pendulum would be diminished; and in governors whose arms are suspended outside of the axis of revolution between the axis and the ball, the rising of the balls will shorten the axis of the cone still more, as not only does the base rise, but the vertex descends, and the change of velocity required to raise the balls and thereby close the valve becomes still greater than in the governors of the first-mentioned construction. This requisite degree of change of speed, when the governor has considerable range of action (which in most cases is desirable) is the cause of such inconvenience where regularity of speed is desirable and the work irregular. The object of this invention is to obviate the above-mentioned difficulty and secure a good range for the governor, with a slight change in its velocity; and to this end the invention consists principally in attaching the arms of the governor to the spindle or revolving frame at points beyond the axis of revolution with respect to the balls so that the arms cross each other between the balls and the point of suspension. By this arrangement, as the balls rise and carry up the base of the cone, the vertex (which is at the intersection of the arms) is caused to rise also, and the axis of the cone diminishes in length very little. The credit of this invention is due to C. P. Buckingham, of Mount Vernon, Ohio.

WASHSTAND.

The object of this invention is to combine with a portable washstand the advantages of a head of water, whereby a supply may be obtained for the basin from a faucet or bracket pipe at pleasure, and thus where a dwelling is not supplied with water pipes leading from a common reservoir, or where it would be inconvenient and objectionable to furnish the house with water pipes, the advantages of having a ready supply of water will be obtained by this invention; at the same time it is not necessary that this washstand should be established in any one place about an apartment. This invention consists in arranging within a cupboard or body of a washstand, and under the basin on the top of said stand a reservoir of a suitable capacity containing a water bellows from which proceeds a tube or pipe, that leads to the basin, and is furnished with a suitable stop-cock; the bellows is suitably weighted and constructed so that it will give a steady upward force to the water contained in it, and supply the basin whenever the cock is turned. This device has been patented to J. R. Ender, of Trenton, La.

FORMING HAT BODIES.

This invention has for its object the presentation of the fur to the former or cone in such a way that the fur will be disposed on the cone with a proper gradually increasing thickness from tip to base. In order to effect this result, two things are to be considered, first, the required gradually increasing thickness of the hat body from "tip to brim," and second, the gradually increasing supply of fur the cone requires from its apex to its base. In order to obtain a perfect hat body it is essential that the fur be distributed on the cone in a very exact manner; all machines hitherto devised have only approached to the proper distributing of the fur on the cone. This invention consists in projecting the fur down upon the former or cone between radial and conical feed rollers, conical pickers being used in connection therewith, in order to

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effect the desired end. The patentee of this invention is William Fuzzard, of Charlestown, Mass.

SPINNING TUBES.

This invention consists in the manufacture of the barrel of a spinning tube of two pieces of tinned iron plate rolled or otherwise worked into tubular form by placing one within the other and soldering them together in such a manner as to form a solid tube; and in soldering bushings of copper into the ends of the inner tube to fit the spindle. The tube thus constructed is much stronger and more durable than the cast iron tubes commonly employed and is much better balanced, as the cast iron tubes, which have to go through the tedious process of drilling throughout their whole length, are seldom perfectly true, for the least open place in the tube leads the drill astray and many are lost or spoiled in the drilling from this cause. The inventor of this improvement is D. D. Allen, of South Adams, Mass.

MACHINERY FOR DRESSING SEWING THREAD.

This invention consists in so applying a series of rollers—or other guides or conductors in combination with a rotary brush cylinder for dressing thread, as to cause every thread to be presented to the said cylinder at two or more distant parts of its circumference, by which means the same result may be obtained with a single brush cylinder, which has heretofore only been obtained by using two or more, namely, a repeated operation of the brushes on the thread. This improvement was designed by Origin Hall and Timothy Merrick, of West Wilmington, Conn.

VARNISH FOR BRASS-WORK.—Take 2 ounces of shellac, and dissolve them in 1 pint of alcohol colored with gumbago or turmeric. This imparts a yellow brass hue to the varnish, and, when it is dry, the metal to which it is applied is protected from becoming tarnished. By adding dragon's blood (the red concentrated juice of the calames draco) to lac-varnish, it becomes suitable for staining various kinds of wood. Articles to which this lacquer is applied should be kept in a warm place until the varnish is dry, or they will dry without luster.

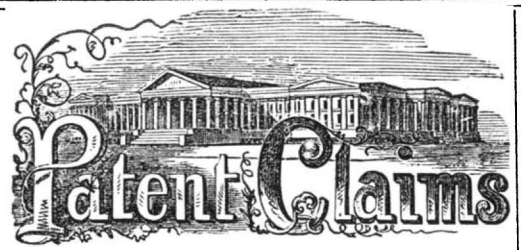
THE GREAT INTERNATIONAL EXHIBITION.—The second great International Industrial Exhibition in London seems to be a settled matter. The *Critic* remarks on it:—"The guarantee fund for the International Exhibition of 1862 subscribed now amounts to £335,300. It is understood that the royal commissioners for the exhibition of 1851 are willing to grant the use of a part of their estate at South Kensington for the exhibition, and that a portion of the buildings to be erected will be permanent, available for future exhibitions of art and industry."

A COAL-BED ON FIRE.—The Navarro (Texas) *Express* says:—"A coal-bed between Wild Cat Bluff, on the Trinity, and Mound Prairie, which has been burning slowly for a number of years, has, during the present dry season, made wonderful progress, and 10 or 20 acres have been burned off, and the fire is still progressing rapidly. Recently on a gentleman and lady riding near it, the horses broke through the crust of earth which covers the fire near the edge, and were severely burned before they could get out."

OPTICAL ILLUSION ON LAKE ERIE.—The Cleveland (Ohio) *Herald* says that a tremendous thunder shower passed over that city on the night of the 3d inst., and adds:—"Between three and four o'clock next morning the appearance of a vessel on fire was seen far out on the lake. Some persons thought they could distinguish the sails. During a heavy gust of wind the light disappeared. Such appearances are not unfrequent on the lake, and the more experienced men along the dock think there has been no vessel burnt."

THE SCIENTIFIC EXPEDITION TO LABRADOR.—The scientific expedition which was fitted out to observe the eclipse of the sun in Labrador has returned, and quite an interesting oral description of the observation was given by Professors Alexander and Barnard at the meeting of the Scientific Association held at Newport.

THE metals sodium and potassium are very rare, because they take fire when exposed to moisture. For the purposes of experiment in the laboratory, they are usually kept in naphtha, ; but coal oil, it has lately been discovered, is much superior for this purpose.



ISSUED FROM THE UNITED STATES PATENT OFFICE
FOR THE WEEK ENDING AUGUST 7, 1860.

[Reported Officially for the SCIENTIFIC AMERICAN.]

*** Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

29,450.—Walter Aiken, of Franklin, N. H., for an Improvement in Knitting Machines:

I claim the sliding traversing sinkers, arranged in the manner described for the purposes set forth.

I claim the sliding traversing sinkers, arranged in the manner described, in combination with stationary needles, as and for the purpose set forth.

I claim supporting the wheel that presses or holds the work or fabric back on the needles by an arm bent or curved around to the under side of the wheel, substantially as described.

29,451.—D. D. Allen, of South Adams, Mass., for an Improvement in Tubes for Spinning Frames:

I claim constructing the barrel of the two pieces of tinned plate iron fitted together, and united by soldering, substantially as described.

And in combination with the barrel composed of two shells of tinned iron plate, I claim the copper bushings, applied and soldered within the inner shell, substantially as described.

29,452.—S. F. Allen, of Chicago, Ill., for an Improved Water-heater for Locomotive Engines:

I claim, first, The employment of the heater, constructed in the manner represented, with steam chambers, a and c, and intervening water chamber, b, said chambers being connected substantially in the manner and for the purpose specified.

Second, In combination with the heater, B, I claim the compound exhaust pipes, D D, when the same are arranged and used substantially as and for the purpose specified:

Third, And in combination therewith, I claim the float valve, V, substantially as and for the purpose specified.

29,453.—Edward Behr, of New York City, for an Improvement in Carriage Brakes:

I claim the combination of the slotted sliding bars, D, and rotary lever, E, with the axle, A, and spokes of the wheel, B, as and for the purpose shown and described.

[This invention consists in having one or two slide bars placed underneath the vehicle at such a point, and arranged in such a way that they may, when desired, be shoved out a requisite distance from underneath the body and between the spokes of the wheels, so as to effectually prevent the turning of the same.]

29,454.—J. M. Brooke, of the United States Navy, for an Improved Deep Sea Sounding Meter:

I claim the combination, in one frame, of two propeller shaped wheels, or their equivalents, rotating in opposite directions, thus compensating the errors arising from the rotation of the whole apparatus about its axis, while descending through the water; and the mode of connecting the endless screws of the propeller-shaped wheels, or their equivalents, with the registering trains, by the aid of the weight used to sink the line, in opposition to any retarding influense on the line above, and of disengaging the same, by the aid of a spring rod and arms, as set forth in the preceding description, when the weight used to sink the line is detached from it.

Also, the mode of clamping the driving wheels of the registering train, when the propellers are disengaged by curved or hooked arms attached to the arms, G, as shown in the accompanying drawings.

29,455.—C. H. Brown, of Fitchburgh, Mass., for an Improved Low Water Alarm Apparatus for Steam Boilers:

I claim the arrangement of the connected pipes, A and B, the slotted rod, E, or other fixed fulcrum, the lever, H, and the whistle, W, or its equivalent, whereby the expansion of the pipes not only causes the operating valve of the whistle, or equivalent, to move from its seat, but the seat to move simultaneously from the valve, substantially as and for the purpose specified.

[This invention consists in a most novel system or arrangement of pipes and a rod for attaching to a steam boiler a steam whistle, or its equivalent, and a lever for operating the valve of the said whistle, or equivalent, whereby when the water in the boiler falls below a certain level the expansion of the said pipes by the admission of steam thereinto, is caused not only to move the valve away from its seat, but at the same time to move the seat away from the valve, thereby as it were, producing a double action of the whistle valve, or its equivalent, and insuring a prompt and certain opening of the valve to sound the alarm.]

29,456.—George Blanchard, of New York City, for an Improvement in Lamps:

I claim the combination of the lamp, A with the slide or tube, B, when the same is provided with the handle, C, so that when taken hold of the lamp drops down by its own weight; thus affording a lantern.

29,457.—John Blocher, of Williamsville, N. Y., for an Improvement in Water Wheels:

I claim the combination of a nnmber of ratchet toothed wheels, arranged upon one shaft, a chain of buckets hung together by knife-edge joints formed of curved flanges at top and bottom of the buckets, and self-adjusting bearings of a guide roller shaft, substantially as and for the purposes set forth.

29,458.—S. Bourne, Jr., of New York City, for an Improvement in Trunks:

I claim, as a new article of manufacture, a seamless trunk, as described and set forth.

[This invention consists in producing a trunk, the body as well as the cover of which is formed in such a manner that on the outside no seam is required, whereby a great amount of labor is saved, and at the same time the appearance of the article is improved.]

29,459.—C. P. Buckingham, of Mount Vernon, Ohio, for an Improvement in Governors for Steam Engines:

I claim, first, The method of attaching the arms to the spindle of the governor, at points beyond the axis with respect to the balls, whereby the acting portions of the said arms lengthen, as the balls rise, carrying up the vortex of the cone described at the same time with its base, and thus maintaining a nearly uniform length of axis, substantially as described.

Second, The method of attaching the balls to the arms and sustaining them by springs, which can yield as may be necessary to the centrifugal force of the balls, whereby the arms of the governor lengthen at the lower end, and the rising of the base and shortening of the axis is diminished, substantially as described.

29,460.—J. M. Buell, of Zanesville, Ohio, for an Improved Churn:

I claim the device, A, constructed as described, in combination with the churn spring, H, handle, g, and head block, C, the whole operating as described and for the purposes set forth.

29,461.—R. B. Burchell, of Brooklyn, N. Y., for an Improved Window Shade Fixture:

I claim the rod, A, provided with racks, a, one or more and smooth surfaces, b, and fitted within the bracket, B, which is provided with a pawl or pawls, k, all being arranged to operate substantially as and for the purpose set forth.

29,462.—Nelson Burr, of Batavia, Ill., for an Improvement in Portable Mills:

I claim the combination of plates, C and D, spiral wings, H H, adjustable grinding surfaces, E and F, and receiver, B, the whole being constructed substantially as and for the purpose specified.

29,463.—D. B. Caldwell, of Cincinnati, Ohio, for an Improvement in Straw-cutters:

I claim the combination and arrangement of the gearing, J j M G, for operating the feed rollers, substantially as set forth.

Second, The specific arrangement of shafting, I L, and gearing, J K, by which different speeds can be given to the working parts of the machine, by a change of the point of application of power, as described.

29,464.—G. L. Carver, of Brazil, South America, for an Improved Marine Propeller:

I claim the combined use of the valve piston-box and reversing apparatus, actuated by the rod, d, the combined parts being constructed and operating in the manner and for the purposes set forth.

29,465.—Matthew Chapman, of Greenfield, Mass., for an Improvement in Handles for Cutlery:

I claim the fitting of the bolsters, C, in the flat tangs, B, by means of the slots, D, therein substantially, as shown and described.

[In the manufacture of cutlery, and all tools or implements of a superior class, which have handles and are provided with tangs and bolsters, the latter are most commonly forged on the implement, the blade, bolster and tang, being all forged from a single bar, a transverse section of which is equal, in area, to that of the bolster; the blade, if a knife is being formed, being drawn out at one side of the bolster, the tang at the opposite side, and the bolster then swaged in proper form. This process of manufacture requires three heats, one for the formation of each part of the implement, and consequently considerable time and labor is expended. The object of this invention is to obviate this difficulty, and to this end the bolsters are made separate or detached from the other parts, and then attached thereto in a peculiar way so as to economize in labor and stock.]

29,466.—Amos Coates, of Marlborough, Ohio, for an Improvement in Chain Pumps:

I claim the combination with the rubber band, E, of the buckets, or water-lifters, F, constructed with long wedge or scoop ends, h; and their cross sections being of a boat or wedge-like form, as shown in Fig. 4, with pieces, d f, hinges, g, arms, D, and projections, c c, the whole constructed and operating conjointly, as shown and described.

29,467.—Jacob Coover, of Chambersburgh, Pa., for an Improvement in Wiring Blind Rods:

I claim the combination of the eccentric, I, and adjustable bar, P, with the driving bar, B, and slat groove, J, as herein shown and described, so that the slat, L, may be so set and held that the wires will enter at an angle to the axis of the slat, all as set forth.

I also claim the employment of eccentric, I, or its equivalent, to compress that portion of the slat which is immediately below the driving bar, so that the slat will not split when the wires are driven into it, substantially as herein shown and described.

I also claim the beveling of the lower part of the plate, F, as shown at x, so as to permit the near approach of the slats, S, to the conducting groove, as and for the purpose set forth.

I also claim the combination of the stop, V, with the conducting groove, Z, as and for the purpose herein shown and described.

I also claim the arrangement, as herein shown and described, of the spring, L, conducting bar, D, conducting groove, Z, and driving bar, B, as and for the purpose herein shown and described.

29,468.—G. W. Cottingham and J. S. Menefee, of Texana, Texas, for an Ant Trap:

I claim the combination, with the cylindrical reservoir, A, which may be protected by an inverted truncated cone, B', if desired, of a conductor, C or C', substantially in the manner and for the purpose set forth.

29,469.—Edward Daniels, of Southampton, Mass., for a Case for Indellible Ink Bottles:

I claim the hollow conical case, A, with the removable bottom, B, for the purposes described.

[This invention consists in the use of a hollow conical case, with the bottom made so as to be removed at pleasure when the case is inverted and the fabric to be marked can be properly stretched over its bottom, thus forming a stretcher and holder in one article.]

29,470.—J. C. Davis, of San Francisco, Cal., for an Improvement in Quartz Mills:

I claim arranging a series of grinders, E, so as to form a spiral line or spiral lines around the center shaft, constructed in the manner and for the purposes set forth.

29,471.—F. DeCompoloro, of France, for an Improvement in the Manufacture of Paper Pulp:

I claim the employment of the cobs of Indian corn, either alone or with the husks, substantially as described, for the purpose of producing pulp for paper.

[This invention is fully explained by the claim.]

29,472.—T. B. DeForest, of New York City, for an Improvement in Lanterns.

I claim making the base or stand-piece, C, of the lantern separate and removable from the other parts of the apparatus, substantially as described, for the purposes set forth.

I also claim the reversible handle, d, in combination with a base, C, cut out to fit partly round the arm; the whole arranged to operate substantially as and for the purposes described.

29,473.—Cornelius Donovan, of East Abingdon, Mass., for an Improvement in Rotary Engines:

I claim combining the pistons, I I', with the main pistons, F F', by means of levers, H H', applied within the piston wheel, substantially as described.

And, in combination with the pistons, F F' I I', and levers, H H', I claim the springs, J J', applied and operating as specified.

[This invention consists in a certain mode of applying, in combination with the sliding pistons, which may be termed the main pistons upon which the steam acts to produce rotary motion, pistons upon which the steam acts to force out the main pistons from the wheel to which they are attached into contact with the stationary cylinder of the engine and hold them out in contact therewith; also, in the employment, in combination with such pistons, of springs.]

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29,274.—C. T. Dunlop, of Glasgow, North Britain, for an Improvement in the Manufacture of Oxyd for Manganese:

I claim boiling with carbonate of lime, and at a temperature of about 280° Fah. thermometer or undue pressure, the chloride of manganese commonly obtained as a waste product in the manufacture of chlorine, and subsequently treating the product thus obtained in the manner substantially as set forth.

29,475.—H. E. Emery, of Lincoln, Ohio, for an Improvement in Rotary Engines:

I claim the case, A′ A″, cam wheel, B, the shaft, W, the metallic ring, Y, secured in annular grooves in the sides of the case, the springs, X X, the packing, d and n, and the jointed valves, a a, constructed and arranged in the manner and for the purpose specified.

29,476.—J. R. Ender, of Trenton, La., for an Improved Fountain Washstand:

I claim combining with a washstand, as described, the water reservoir or bellows, E, and pipe, F, leading up to the basin, B; the whole being arranged and operated in the manner and for the purposes set forth.

29,477.—Orlando Foster, of Kenosha, Wis., for an Improved Machine for Upsetting Tire, &c.:

I claim the jaw, A, movable jaw, B, toothed cams, D D, dies, F F, eccentric lever, C, swaging block, 1, punching block, 2, and shears, 3, as they are arranged, in relation to each other, and operated as set forth.

29,478.—Wm. Fuzzard, of Charlestown, Mass., for an Improvement in Machinery for Forming Hat-bodies:

I claim the employment or use of rotating conical rollers, d e, in connection with pickers, E, arranged over and concentric with a hat former or cone, B, to operate substantially as and for the purpose set forth.

I further claim the arrangement of the picker cases, F, connected together and placed relatively with pickers, E, and rollers, d e, so as to form a feed table as well as cases for the pickers, as described.

29,479.—L. P. Garner, of Ashland Borough, Pa., for an Improved Apparatus for Separating Slate from Coal:

I claim the employment of the screen within the screen, movable, so that the inside screen may be moved or depressed, at the will of operator, thus increasing or diminishing the width of the spaces or openings between the bars, by reason of the peculiar shape of the bars, so that larger or smaller pieces of slate and other impurities may be separated from the coal and other materials that may be passed over said screens.

29,480.—Henry Garrett, of Richmond, Mo., for an Improved Spike for Hinges:

I claim making the tail end of the spike in the form of a crotch, with the prongs thereof in the form described, that they will turn in the wood as shown; this I claim not as a principle, but as a new article of manufacture.

29,481.—W. H. Gwynne, of New York City, for an Improvement in Apparatuses for Compressing Gas:

I claim the arrangement, for the purpose of compressing gas, of the drums, A A′, supply pipe, C, and discharge pipe, D, in combination with the cylinder, B, constructed and operating substantially as described.

[The object of this invention is to compress a quantity of illuminating gas in a drum or tank, so that a large quantity of gas can be carried from the place where it is manufactured to any distance, and that villages and towns or country seats can be supplied with gas from works situated at a great distance from the same.]

29,482.—Stuart Gwynn, of New York City, for an Improved Method of Generating Steam:

I claim, as new in the generation of steam or other vapors, reproducing it after performance of its duty by condensing it in the generator which served to produce it, and employing a regenerator or superheater for operation in concert with the boiler, in the manner described, whereby the latent and sensible heat of the steam is made available to the re-production of steam, and the latter, though circulated out of and back through the boiler, kept at a proper working tension.

29,483.—Wm. Halderman, of Freeport, Ill., for an Improved Device for Bolting Flour:

I claim the employment or use of the vibrating screens, E F, in connection with the endless apron, H I, and suitable spouts, J l m o a′, arranged relatively with each other and within a case or box, A, as and for the purpose set forth.

[This invention consists in the employment of screens having a vibratory motion, and used in connection with endless conveying aprons; the screens and aprons being placed within a suitable case or box, and arranged in such relation with each other, and with proper spouts, that a very compact and efficient bolting device is obtained, and one that may be very easily adapted for bolting different kinds of flour and meal; or, in other words, varied in its operation, as the nature of the work may require.]

29,484.—Origin Hall and Timothy Merrick, of West Willington, Conn., for an Improvement in Thread-dressing Machines:

We claim the arrangement of the threads to pass in tangential lines to the circumference of the brush cylinder, B, substantially as shown and described, so that each thread, in its passage through the machine, will be simultaneously acted upon by the same brush at some part of each tangent, as and for the purpose set forth.

And we also claim so arranging the grooves, d d, in the rollers, C C1 C2 C3, or so applying the thread in such grooves, that the several places of contact between either thread and the brush cylinder are in different planes of revolution of the latter, substantially as and for the purpose set forth.

29,485.—Thomas Hall, of St. Louis, Mo., for a Feeding Apparatus for Printing Presses:

I claim, first, The tongued vibrating and reciprocating gripper, u, in combination with the gridiron plate, d; and—

Second, I claim the use of the binding bars, n n, in combination with the plate, f; and—

Third, I claim the manner of adjusting the plate, f, described.

29,486.—A. G. Hamaker, of Peora, Ill., for an Improvement in Gas-burners:

I claim, first, Constructing the heating-chamber of the burner substantially as described, or in an equivalent manner, so that the different jets shall act upon the side of the burner, and unite in a single flame above its apex.

Second, Arranging over the jet orifices a deflecting plate, constructed substantially as described, so as to deflect and give the required direction to the jet of flame.

Third, The combination of a chambered burner with a central pipe, so arranged that its orifice or orifices of discharge will be above the jet orifices of the burner.

29,487.—D. S. Heffron, of Utica, N. Y., for an Improved Refrigerator:

I claim the construction and arrangement of the ice-box, E, the registers, F1 F2 F3 F4, the openings, G1 G2, the spaces, H1 H2 H3, and the drying chamber, K, substantially as and for the purpose specified.

29,488.—Alexander Hill, of Dubuque, Iowa, for an Improvement in Compositions for Tanning:

I claim the employment or use, for the purpose of tanning hides or skins, of a composition prepared by dissolving in water the above-named ingredients, mixed together in about the proportion set forth and described.

[This composition enables the tanner to produce leather of the best quality, in a very short time.]

29,489.—Carl Henrichs, of New York City, for an Improvement in obtaining Coloring Matter from Oak Bark:

I claim the process of concentrating dyeing extracts to such a high degree, by boiling and treating them as described in the foregoing specification.

29,490.—C. B. Hutchinson, of Auburn, N. Y., for an Improved Mill for Grinding Grain and Apples:

I claim, first, The above-described combination of a cider and grain mill and corn-sheller, substantially as specified, for the purposes set forth.

Second, I claim the peculiar construction and arrangement of the crushing teeth, m and Q, operating substantially as set forth, for the purposes specified.

29,491.—Wm. Hyde, of Emery, Ohio, for an Improvement in Beehives:

I claim, first, The combination of the box, E, with the box, A, when said box, E, is arranged as specified, for the purpose of increasing the capacity of the hive.

Second, I claim, in combination with my extension hive, the use of cloth or other suitable material combined with galvanic plates, when applied in the manner and for the purposes described and represented.

[This invention consists in combining with a beehive an elevating box or supplemental hive, arranged in such a relation to the lower box or hive that the capacity of the hive may be gradually increased as the honey is made, without disturbing the bees or honey, or without liability of being stung; and, in combination with the movable box, the invention consists in a novel manner of packing the joint of one box with the other, and in preventing the moth from entering the hive at this joint.]

29,492.—L. S. Ingraham, of Grafton, Ohio, for an Improved Butter-worker:

I claim the bed, made of two parts, F and S, conical roller, A, unequally fluted on half or more of its periphery, button, C, metallic gutter, H, hinges, N and m2, turntable, m, grooved gutters, y y, and slots, x x; the whole constructed and used as and for the purposes described.

29,493.—Anthoni Iske, of Lancaster, Pa., for an Improved Cupboard and Sink:

I claim the combination and arrangement of the sliding sinkboard, B, and the hinged wings, A, when attached to a cupboard or closet, substantially as and for the purpose specified.

29,494.—B. W. Jewett, of Gilford, N. H., for an Improvement in Artificial Legs:

I claim, first, The construction and operation of the guide, b′, connected by a suitable joint to the thigh-piece, A; the guide, b′, being free to move through the slotted bar, E, and being inclosed by the spring, e, as set forth.

Second, The flanges, q q′, and the lips, x x′, in combination with the bolt, M, constructed and operating as set forth.

29,495.—Wm. H. Kimball, of Augusta, Maine, for a Hand-cuff:

I claim, first, The cuff, so formed as to open opposite the rule joint, in equal parts.

Second, The ratchet, 2, as applied to the cuff.

Third, The connection of the draw screw, 3, to the ratchet, 2, by a vibrating joint.

29,496.—Wm. F. Kubler, of New York City, for a Shirt Stud:

I claim a stud with a screw shank and point, in combination with a spring clamp, substantially as described.

29,497.—Wm. S. Lawyer, of Gratiot, Ohio, for an Improvement in Seeding Machines:

I claim the combination of the suspended yielding hopper bottom, G, with the fluted roller; the same being arranged and operated substantially as described.

[This invention consists in distributing the seed by means of a fluted roller working under the rising and falling bottom of a flexible hopper, so that, by rotating said fluted roller, the seed is caused to discharge, and, at the same time, the bottom of the hopper closes down on the top of the distributing roller, so as to prevent any discharge of seed when the roller is at rest.]

29,498.—John Leigh, of Edgefield, S. C., for an Improved Bedstead:

I claim the employment of the rail caps, composed of arms, D D′, straps, E, bar, a*, made in one piece, with pins, a c, in combination with the rails, B C, eyes, b d, and posts, A, as shown and described.

[This invention relates to an improved mode of securing together the posts and rails of a bedstead, as well as in an improved way of attaching the head-board to the posts, whereby the bedstead may be readily put-up and taken-down; the usual embarrassment and labor attending the ordinary screw connections being fully obviated.]

29,499.—B. F. Lemmon, of New Albany, Ind., for an Improvement in Condensers for Steam Engines:

I claim, first, The argangement of the jacket, C, covering the steam pipe, D, with the pipes, a and d, the casing, B, and the condensing chamber, A, provided with the perforated head, e, substantially as and for the purpose specified.

Second, The arrangement of the water trap, E, and the valve, F, with the condensing chamber, A; the whole being combined and used substantially as and for the purpose specified.

29,500.—N. C. Lewis, of Boston, Mass., for an Improved Machine for Rolling Blanks.

I claim the combination of four eccentric rolls, constructed and arranged, with respect to each other, as described, and of appropriate form to roll file blanks, as set forth.

29,501.—Adolphus Lind, of San Francisco, Cal., for an Improvement in Water Wheels:

I claim providing the buckets, G, of a water wheel with a series of slots, K, in combination with dividing plates, L L, and slots and set screws, m m, for the purpose of regulating the size of the buckets.

29,502.—Herman Linderman, of New York City, for a Pianoforte:

I claim the arrangement and construction of a curved or arched structure, as a substitute for the long and cross blocks now in use, in the manner and for the purpose substantially as described.

29,503.—Isaac Lindsley, of Providence, R. I., for an Improvement in Making Gold Chains:

I claim forming the arms of the links convexo-concave in the operation of cutting the said link from the sheet or strip of metal, substantially in the manner and to the end specified.

29,504.—J. H. Maydole, of Eaton, N. Y., for an Improvement in Harvesting Machines:

I claim the combination and arrangement of mechanism, substantially as described, whereby either end of the finger bar may be elevated from the ground independent of the other, or the entire finger bar, by an attendant, substantially as described and for the purpose set forth.

29,505.—Alexander McElroy and J. H. Kimble, of Fox Lake, Wis., for an Improvement in Seeding Machines:

We claim, first, The arrangement of the adjustable plate, a, and vibrating lever, F, with the cam wheel, G, distributing bar, H, and slides, e e, substantially in the manner and for the purpose specified.

Second, The arrangement of the seed box, B, and the seed bar, H, as constructed, with the converging box, I, and the triangular dividing bars, d and c; the same being used substantially as and for the purpose specified.

29,506.—Ferdinand Meyrose, of St. Louis, Mo., for an Improvement in Machinery for Molding Candles:

I claim, first, The combination of candle molds, k, and hollow pistons, j, which latter have a reciprocating motion, and serve the double purpose of guiding the wick, h, and of pushing the candles, when finished, out of the molds, substantially as and for the purposes set forth.

Second, The combination of candle molds, k, open at the bottom, with two frames, l m l′ m′, and two pairs of cams, p q p′ q′, or their equivalents, for the double purpose of clamping the wicks between the two frames while the candles are being cast, and of opening the frames wide enough when the candles are finished, and allowing them to be pushed down through the opening at the bottom of the molds and between the said frame, substantially as and for the purposes set forth.

29,507.—J. L. Middlebrooks, of Salem, Ga., for an Improvement in Cotton Cultivators:

I claim the revolving hoes, a a, secured upon the shaft, b, and operated as shown, in combination with cutters, c c, and plows, d d and f f—the whole being constructed and arranged substantially as and for the purpose set forth.

29,508.—Samuel Mills, of New York City, for an Improved Life-boat:

I claim, first, The arrangement of the several compartments to reversible life-boats—the same being protected by the outside section in the manner as described and for the purposes set forth.

Second, The application to reversible life-boats of screw seats—the same being constructed and arranged substantially as and for the purpose specified.

29,509.—Evariste Mire, of New Orleans, La., for an Improvement in Mills for Cutting and Grinding the Corn, Cob and Husk together:

I claim the combination of the knives, K and f, when used in conjunction with the teeth, O and V, arranged and operated as or substantially as and for the purpose set forth.

29,510.—Richard Montgomery, of New York City, for an Improvement in Iron Cars:

I claim the combination of the curved, corrugated top pieces, B, with the corrugated side or base pieces, A, and coupling pieces, H and G—the whole arranged in relation to each other as and for the purposes set forth.

29,511.—Hiram Nash, of Maysville, Ky., for an Improvement in Water Elevators:

I claim the loose drum, G, its toothed flange and pawl, K, and clutch plate, H, with the crank-shaft, E, lever, F, wedge, J, and plate, l, for giving to the shaft an end play, in combination with band, b, and bucket, D—when the whole is arranged, constructed and operated substantially in the manner and for the purposes set forth.

[This invention consists in an improvement in hanging well buckets whereby the bucket may be raised with a crank in the usual way and then lowered into the well again by its own gravity, without turning the crank, and by a fast or slow motion as may be desired. It further provides for drawing the water from the bucket automatically when the bucket is brought to its highest point of elevation.]

29,512.—E. W. Nichols, of Worcester, Mass., for an Improved Holder for Polishing Wheels:

I claim the arrangement of the bar, L, screw, J, roller, H, and gage, K, in combination with shaft, D, clamp, G, rollers, J, and the handles, E″ and F, when employed substantially as and for the purpose specified.

I also claim the clamping device for holding articles by their edges consisting of the handle piece, P, lever jaw, Q, stationary jaw, O, and hook, S—when arranged and employed substantially as specified.

29,513.—Joseph Olmstead and W. A. Walker, of Victoria, Ill., for an Improved Machine for Upsetting Tire:

I claim the combination with the stationary and movable plates, C C′, and their blocks, a a′, and jointed dogs, D D, with the lever and connecting rod, E E′, and the hand lever and toggle-jointed levers, J G G′—all arranged and operating conjointly in the manner and for the purposes set forth.

[This invention consists in the employment of a horizontal, stationary and a movable bedplate on each of which is a fixed jaw and a jointed dog or clamp, which latter are operated by a jointed lever and connecting rod that move them up to the tire simultaneously and cause each of them to clamp the tire with an equal pressure. It consists in combining with the movable bedplate toggle-jointed levers that are operated by a hand lever for upsetting the tire.]

29,514.—W. H. Paine, of Sheboygan, Wis., for an Improved Surveyor's Measure:

I claim, first, a continuous sheet metal measure for surveyors' purposes, substantially as set forth.

Second, The combination of the jointless, metal strip or tape-expansion-indicating gage or scale and circular scale—the whole constructed, arranged and operating in the manner and for the purposes described.

29,515.—Edwin Parker, Benjamin Parker and T. S. Parker, of Schenectady, N. Y., for an Improved Lubricator:

We claim the combination of the oil cup having a perforated bottom with the perforated plug, B, arranged substantially as set forth and made to to operate automatically in the manner and for the purposes mentioned.

We further claim, in combination with the oil cup, A, when said cup, A, is constructed and arranged substantially as described, the friction wheel, G, for transmitting motion from the shafting to the oil cup as and for the purposes set forth.

[This invention consists in arranging in an oil reservoir of a suitable capacity a plug or stem with a perforation through it, in such a manner that, by rotating the oil reservoir, said perforation will receive oil from the cup and discharge this oil on the surface to be lubricated, the motion of the oil reservoir being made dependent upon the motion of the shaft or whatever movable object it is desired to lubricate, so that when the prime-mover stops, the supply of oil will cease.]

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29,516.—John Parsons, of Cleveland, Ohio, for an Improvement in Bottom Plates for Drain Tiles:

I claim the two ridges, a a, on the bottom, A, substantially as described and for the purposes set forth; but—

I do not claim a bottom without the ridges, as my invention, neither do I confine myself to the bottoms and ridges being made of any particular material.

29,517.—J. S. Peckham and Merritt Peckham, of Utica, N. Y., for an Improvement in Stoves:

We claim the guard plate, B, the holder, C, and the under grate cover, F2, constructed and operating substantially as described, in combination—the said guard plate, B, holder, C, perforated doors, H, and under grate cover, F2, constructed and operating substantially as described, in combination.

29,518.—A. W. Porter, of St. Johnsville, N. Y., for an Improvement in Machines for Digging Post Holes:

I claim the slotted spades or shovels, A, as secured by the shackle bar, B, and operated by the toggle joint, C, substantially as set forth and for the purpose specified.

29,519.—C. A. Priest, of Winslow, Maine, for an Improved Shoe-pegging Machine:

I claim my improved feeding and holding apparatus, the same consisting of the two blades, G H, their slotted carriers, K K L L, and a common stationary or adjustable fulcrum shaft, M, such carriers being operated by bell-cranks, as specified.

I also claim the mode of applying each blade to its carriers, viz: by means of the slides, cars, springs and adjusting screws, operating together and with the blade and carriers, substantially as described.

I also claim the application of the adjusting sliders and screws to the opposite ends and fulcrum of the knife, as specified.

29,520.—G. K. Proctor, of Beverly, Mass., for a Combined Clock and Burglar Alarm:

I claim the attaching of the lever, E, of the clock alarm to the lever, F, which has springs, G H, connected to it, and also a rod and cord, d e, by which said lever, E, is connected to the slide, J, on the door frame, I, which slide is arranged with the projection, k, on the door, J, as and for the purpose set forth.

[This invention consists in a very simple modification of a lamp lighting device and alarm attachment for clocks which was patented by this inventor on the 24th of January, 1860.]

29,521.—Daniel Read, of Hamilton, N. Y., for an Improved Grinding Mill:

I claim the rotating, cutting cylinder, D, in connection with the vibrating, toothed concave, G, as and for the purpose set forth.

I further claim the combination of the cutting cylinder, D, concave, G, and feeding or toothed cylinder, F, arranged for joint operation as and for the purpose set forth.

[The object of this invention is to obtain a machine by which substances may be ground for fodder, such as corn on the stalks, straw, hay and various other substances which cannot be readily ground or reduced by ordinary grinding mills. The invention is also applicable for grinding bark, cane, &c.]

29,522.—C. J. Schoenemann, of New York City, for an Improvement in Piano-forte Keys:

I claim the arrangement, in front of the ordinary key-board, of an additional series of keys equal in number to the keys of the ordinary key-board, and so placed that their upper surfaces are all on the same level, and that each key of the additional series connects with one of the keys of the ordinary key-board as and for the purpose set forth.

[The object of this invention is to enable the player to execute chromatic passages after a few hours' practice with a greater perfection than they can be played by the greatest pianist, and this at a velocity never to be attained by a lifetime of practice on the ordinary key-board.]

29,523.—August Semmendinger, of New York City, for a Photographic Camera:

I claim, first, The wheels, m m, in combination with the extensionsal parts, C C, for the purpose of sliding the same in the grooves, n n, substantially as described.

Second, Attaching the sliding frame, D D, and the board, E, to the camera, substantially in the m nner described.

Third, The foot, E', and the stand, F F, hinged to their respective frames in the manner and for the purpose substantially as described.

29,524.—C. Sewerkrop, of Louisville, Ky., for an Improvement in Cutting Boxes:

I claim the slotted crank, J, on the shaft, E, in combination with the pitman, L, rocking shaft, M, and devices for imparting the feed motion, O Q R, all arranged substantially as and for the purposes described.

29,525.—George Sherman, of Memphis, Tenn., for a Metallic Alloy for Journal Bearings and Boxes:

I claim the alloy of the aforesaid metallic materials, made in the manner and proportions set forth.

29,526.—L. H. Shular, of Crawfordsville, Ind., for an Improved Car Coupling:

I claim the combination of the vibrating catch bar, c, elevating spring, D, presser bar, E (or its equivalent), depressing and guide spring, G, and connecting link, B—the whole constructed and operating substantially as described for the purpose set forth.

29,527.—N. H. Slade and J. N. Scranton, of Bennington, Vt., for an Improvement in Driving Bands for Spinning Frames:

We claim the arrangement of the guide pulleys, g g', adjustable guide pulleys, n n' m m' i j, bands, e e', pulley, D, and loaded tightening pulleys, s s', as and for the purpose shown and described.

[The object of this invention is to drive all or any number of spindles or flyers on one side of a spinning frame with a single band acting with a uniform friction upon the whirl of each of such spindles, thereby producing a more uniform velocity than can be produced by a number of separate bands, one for each spindle or flyer, from a common drum; and the invention consists in a certain arrangement of one or more driving pulleys, a series of guide pulleys, and one or more loaded tightening pulleys, and of a band or bands running thereon to effect the result.]

29,528.—Elizabeth M. Smith. of Burlington, N. J., for an Improvement in Reaping and Mowing Machines:

I claim operating the devices for putting the cutters of reaping and mowing machines in and out of gear by the agency of the driver's seat, substantially as set forth.

29,529.—C. V. Statler, of Wataga, Ill., for an Improved Machine for Upsetting Tire:

I claim the dogs, D D' and E E', with adjustable bar, G, and its springs, d d, in combination with the jointed levers, A A, operated by the screw and link, C C', and arranged substantially in the manner and for the purposes set forth.

[This invention consists in the employment of two levers jointed togother like a pair of large pincers and operated so as to open and close by screw power applied to the longer arms of the levers. It consists in combining with the jaws of these levers four jointed, toothed dogs and an adjustable bar; the jaws hold the tire firmly and confine the tire between the two pairs of dogs and prevent it from "kinking," while the dogs are brought closer together by contracting the longer arms of the levers with the screw power.]

29,530.—Jacob Stuber, Frederick Frank and P. D. Tobie, of Utica, N. Y., for an Improvement in Stoves:

We claim the arrangement of the perforated plate with smaller hollow cone, A, attached, larger hollow cone, B, and flues, C C, in connection with the revolving damper, Fig. 4; the whole being constructed and operated in the manner and for the purposes set forth.

29,531.—L. P. Teed, of White Deer Mills, Pa., for an Improved Arrangement for Disposing of the Sparks from Locomotive Engines:

I claim the conducting pipe, F, with its openings, m m, and hinged shield, G, when the latter are connected to the bar, H, for simultaneous movement and when the whole is arranged on the top of a railway car and combined with the conducting pipe, D, and chimney, a, of the locomotive as and for the purpose set forth.

29,532.—Gabriel Utley, of Chapel Hill, N. C., for a Machine for Trimming Books and Paper:

I claim, first, The reciprocating knives, A B C, and a three-armed slotted lever, J K, in combination with a follower, M P, substantially as and for the purposes set forth.

Second, Operating the knives substantially as described.

29,533.—D. F. S. Ways, of Baltimore, Md., for an Improved Lightning-arrester for Telegraphs:

I claim effecting the suspension and renewal of electrical communication between the main wires and the interior of a telegraph office or building in which such office is placed, by the use of an electric current independent of the main line, substantially as described.

29,534.—B. D. Whitney, of Winchendon, Mass., for an Improved Lathe:

I claim a finishing tool, F, in combination with a forming cutter, o, and a sliding rest, m, so arranged that the different portions of the finishing tool shall be brought to bear successively upon corresponding portions of the article being turned immediately adjacent to the sliding rest, as set forth.

I also claim the spring bearing, S, within the annular rest, m, operating as described for the purpose specified.

29,535.—J. M. Wood, of Seneca, N. Y., for a Willow-peeler:

I claim, first, The circular friction disks as described and for the purpose set forth, with its suitable covering of leather or other material.

Second, The screw cylinder, with its cone-shaped plain end, its variable screw and its groove.

Third, The combination of the disk and screw cylinder with adjustable facilities as described and set forth.

29,536.—J. H. Wygant, of Hackensack, N. J., for an Improvement in Stopping and Starting City Railroad Cars:

I claim the combination of the inclined planes arranged on a car body having an end play, or on the truck frame, with the friction rollers, G G, or their equivalents, arranged substantially as and for the purposes set forth.

I further claim, in combination with a car body hung in such a manner, on rollers, as to ride on inclined planes, the chain brake operating upon the car axles and attached to both ends of the car body as and for the purposes set forth.

[This invention consists in mounting a car body on suitable friction rollers projecting up from the truck frame in front and rear of said frame, and arranging double inclined planes on the car body in such relation to the friction rollers that when the car is suddenly stopped by applying a chain brake to the axles, the body of the car will be moved backwards and up the inclined planes, where it is held until the car is to start. On releasing the brakes again, the body of the car will move forward and impart its momentum to the wheels so as to start them, when the horses may proceed with comparative ease.]

29,537.—Walter Youmans, of Waterford, N. Y., for an Improvement in Car Wheels:

I claim a car or carriage wheel having a wooden felly, spokes and hub, and two metallic tires, D E, with one tire overlying the other as specified and represented in the annexed drawings, and the outer tire removable without disarranging the inner one.

29,528.—C. R. Alsop, of Middletown, Conn., assignor to J. W. Alsop, of New York City, for an Improvement in Rammers for Revolving Fire-arms:

I claim combining the plunger, C, with the lever, D, and the frame, A, by means of the two pins, f g, and the two slots, d e, substantially as specified.

[This invention consists in combining the plunger of the rammer with its operating lever and with a rammer frame that is detachable from the stock by means of a fixed fulcrum pin in the frame, a transverse pin secured in the rammer and two slots arranged in the lever, such mode of combining the plunger, lever and frame providing for the operation of the lever with gradually-increasing effect in ramming the charges into the chambers, and providing for the easy disconnection of the lever and plunger from the frame when the frame is detached from the body of the arm.]

29,539.—Charles Alexander (assignor to himself and W. C. Choate), of Washington, D. C., for an Improved Cork-drawer:

I claim the within-described cork-drawer, as an article of manufacture, consisting of a pointed rod, a handle and a reversible cross-bar, operating substantially as specified.

29,540.—L. W. Buxton (assignor to himself and R. B. Cram), of Nashua, N. H., for an Improved Bed Bottom:

I claim the rods, c, with their pulleys, f, in combination with the elastic loops or bands, C, and cords, g h, operating substantially as described.

29,541.—Thomas Brown, Jr. (assignor to himself and W. S. Brown), of South Danvers, Mass., for an Improvement in Machines for Cutting Glue:

I claim the above-described glue-cutting machine consisting of the glue box or receiver, A, the reciprocating separator or wire, C, and an elevator, D, arranged and combined together and with mechanism for operating such separator and raising such elevator, substantially in the manner as described.

And, in combination therewith, I not only claim the bars, v w, arranged with respect to the box, A, and the separator, C, for the purpose hereinbefore set forth, but I claim the mechanism or levers, L M, for lifting the pawls, t u, out of action with the racks for the purpose specified.

29,542.—O. F. Burton (assignor to himself and M. H. Hovey), of New York City, for a Fire-escape:

I claim, first, Combining the ladders, A A', with each other, and with the trucks, C C', substantially in the manner herein described, so that, by pulling the trucks close up together, the ladders are elevated, and by pushing the trucks apart, the ladders are lowered.

Second, The arrangement of the rings, B B', in combination with the hinged ladders, A A', constructed and operating substantially as and for the purpose set forth.

Third, The combination of the circular platforms, c c', of the trucks, with the rings, B B', substantially as and for the purpose specified.

[An engraving and full description of this invention will appear in one of the early numbers of the SCIENTIFIC AMERICAN.

29,543.—Abraham Baker (assignor to himself and G. A. Brown and John Pirky) of Shenandoah county, Va., for an Improved Instrument for Paring Horses Hoofs:

I claim the construction of the beak-shaped cutting instrument arranged with the guard, adjusting set-screw, as represented in figures 1, 2, 3, 4, substantially as herein set forth and described.

29,544.—J. M. Cooper, of Chambersburgh, and W. L. Haller (assignors to J. M. Cooper, aforesaid), of Carlisle, Pa., for an Improvement in Sealing Fruit Cans:

We claim the combination of the ring, the gasket, the cap or plate, and the vertical presser, when arranged and applied upon the outside of the neck of a fruit jar or can for sealing it, as herein set forth and explained.

29,545.—Wm. Gluyas (assignor to himself and W. K. O'Neill) of San Francisco, Cal., for an Improved Amalgamator:

I claim the relative arrangement of alkali trough No. 1, water trough No. 5, quicksilver troughs No. 2 and No. 4, and revolving amalgamator, d, upon a furnace (containing three fire-flues, A A' B), the four troughs and the amalgamator relatively communicating with each other by means of nozzles, a a a, and pipes K l, so as to operate in conjunction with each other, as and for the purposes set forth.

29,546.—T. C. Hendry (assignor to himself, J. Dillworth, S. H. Dean, T. J. Hutson, E. H. Patterson and A. J. Hendry), of Conyers, Ga., for an Improvement in Wheels for Vehicles:

I claim the hub, A, constructed of two parts, a v, the former having radial recesses to receive the inner ends of the spokes, in combination with the screws, h, fitted in the annular recess, g, of the part, a, provided with nuts, i, so arranged as to form the bearings of the inner ends of the spokes, as and for the purpose herein set forth.

[The object of this invention is to construct a wheel in such a manner that the spokes may be adjusted so as to admit of the expanding of the wheel, and the consequent tightening of the tire when necessary—the invention also admitting of the removal of any of the spokes or felloes, so that they may be replaced by new ones when required. The invention consists in constructing the hub of metal and of two parts, the interior of the hub being provided with screws and nuts, and the inner ends of the hubs bearing on the latter—all being so arranged that the desired end is attained.]

29,547.—G. F. Hebard, G. J. Hill and S. D. Rockwell (assignors to Sanford, Warren & Harroun and G. J. Hill), of Buffalo, N. Y., for a Printing Press:

We claim an intermittent feed, constructed, arranged and operating for the purposes and substantially as described. We also claim in combination therewith the cutters, R S, for the purposes and substantilly as set forth.

29,548.—George Hancock (assignor to himself and J. M. Rutherford), of Providence, R. I., for an Improvement in Hose Coupling:

I claim the combination of the lever catches, h h h, with the elastic band, I, or its equivalent, substantially as described for the purpose specified.

I also claim the sleeve, G, in combination therewith, constructed and operating as described for the purpose specified.

29,549.—Michael Offley (assignor to himself and Wm. Colton), of Baltimore, Md., for an Improved Self-locking Device for Omnibus Registers:

I claim the combination of the pin, m', with the arm n3, when arranged for joint operation, substantially as herein described, for the purpose set forth.

29,550.—John Palmer, of Fort Scott, Kansas, assignor to himself and J. F. Draper, of Chicago, Ill., for an Improvement in the Manufacture of Vinegar:

I claim the discovery of a material for filling vinegar apparatus —"The Corn Cob."

29,551.—Harvey Rice, of Concord, N. H., assignor to J. H. Deming and T. H. Jenkins, of New York City, for an Improvement in Journal-boxes for Railroad Cars:

I claim, combining with the end-bearings of the journal and box, oil-lifting projections on the journal, and the channel way for receiving the oil and leading to and discharging it at or near the center of the end-face of the journal, substantially as and for the purpose specified.

29,552.—J. B. Rowell (assignor to Jonathan Buffum), of Lynn, Mass., for a Composition for Covering Black-boards:

I claim the combination of the herein before-mentioned ingredients, for the purpose set forth, substantially, in the proportions described.

29,553.—Volney Stockton, of Williamsburgh, Ohio, assignor to himself and Mitchell & Rammelsberg, of Cincinnati, Ohio, for an Improved Metallic Chair Bottom:

I claim, as a new article of manufacture, a chair bottom of corrugated sheet metal as herein shown and described.

29,554.—Charles Wells and Henry Barth (assignors to the Cincinnati Type Foundry), of Cincinnati, Ohio, for an Improvement in Printing Presses:

First, We claim, in printing presses having a vibrating platen or a vibrating bed, seizing the sheet of paper while upon the platen, by nippers, T S.

Second, We claim the fly, R, for properly disposing of the sheet of paper after it is printed, in combination with a vibrating platen or a vibrating bed and nippers, T S, arranged and operating substantially as described.

Third, We claim carrying the fly, R, and nippers, T S, by the same frame, X, that operates the ink rolls in printing presses which employ a vibrating platen or vibrating bed.

Fourth, We claim the stationary nipper, S, the nipper, T, and the spring, U, constructed, arranged and operating as described, in combination with the hook, Y, or its equivalent, upon the vibrating platen or bed, C, for the purpose described.

Fifth, We claim the bar, Q, vibrated by frame X, but pivoted eccentrically thereto, having rack, p, giving motion to pinion, P, substantially, as and for the purpose described.

RE-ISSUE.

Henry Wight, of Cambridge, Mass., assignor to W. C. McClallan, of Springfield, Mass., for an Improvement in Wooden-soled Shoes. Patented March 6, 1860:

I claim the new manufacture of boots and shoes as described, viz., a boot or shoe having a wooden sole made in two parts or pieces (an inner sole, b, and an outersole, a), with the edge of the upper secured between them, and the two soles fastened together by any suitable fastenings, substantially as described.

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ADDITIONAL IMPROVEMENT.

M. L. Bauder, of Cleveland, Ohio, for an Improved Churn. Patented January 19, 1858:

I claim the herein modification in the structure of the beaters, whereby I am enabled to avoid the sharp angle, m, seen in figure 5, in the manner and for the purpose set forth.

DESIGNS.

E. J. Ney (assignor to the Lowell Manufacturing Company), of Lowell, Mass., for Designs for Carpet Patterns (three cases).

H. G. Thompson, of New York City, assignor to the Hartford Carpet Company, of Hartford, Conn., for Designs for Carpet Patterns (eight cases).

NOTE.—This week's list of claims exhibits the fact that, out of 105 patents granted, THIRTY-SEVEN cases were prepared by the Scientific American Patent Agency. This large proportion—about ONE-THIRD—has, however, often been equaled, and sometimes even exceeded, during the present year.

Notes & Queries

CORRESPONDENTS sending communications for publication in our columns are requested to avoid writing on both sides of a sheet of paper. This fault, though common to persons unaccustomed to writing for the press, gives great trouble to the printer (especially in long articles), and, when combined with illegibility of handwriting, often causes interesting contributions to be regretfully consigned to our waste-paper basket.

J. D. F., of Iowa.—Making no allowance for friction, one horse-power would raise 1,000 bushels of grain 30 feet in an hour, and allowing 50 per cent loss, two horse-powers would do the same work. We presume a two-horse-power Ericsson engine could be run for 25 cents per day, but that depends altogether on the locality. In the coal mines of Pennsylvania, it could be run for nothing, and in Pittsburgh or Philadelphia, it will not cost over 25 cents per day, owing to the cheapness of fuel in those cities.

C. P. J., of N. Y.—We could not make out the spelling of the word of which you inquire the meaning.

L. C., AUBERT, of Thibodaux, La., wishes to know the address of some reliable shipbuilder with whom he can contract for a pleasure yacht.

L. Q. C. WISHART, of Philadelphia, Pa., wishes to know where he can get a pill machine that will make a large quantity of pills.

M. B. R., of Texas.—You will find an engraving of a balloon precisely of your pattern in the first volume (old series) of the SCIENTIFIC AMERICAN.

S. E., of N. J.—Your account of your rational and accurate observations of the great meteor is received. We shall either use it ourselves or pass it to Professor Mitchell.

G. W. F. M., of Mass.—Your suggestion is too grave for publication on mere rumor.

O. H. P. M., of Ark.—The nominal horse-power of a high pressure engine has never been correctly defined. You ask: "What would be the power of one having a cylinder 12 inches in diameter and two feet stroke with 60 lbs. pressure of steam?" It may be worked as a 20-horse or a 60-horse power according to the speed of the piston. When running at the rate of 300 feet per minute, its power is 64-horse nearly. We prefer the vertical tubular boiler to all others for economy of fuel. You may run your 5-foot circular saw, and do good work at a speed of 315 revolutions per minute, with a half-inch feed per revolution.

W. A. F., of Cal.—We have never seen small glass soda fountains like the one represented in your sketch. Salomon, of London, has no agent in this city, so for as we know, for his ear instruments.

H. M., of Ohio.—Batteries for electro-plating and telegraphic purposes are manufactured by Messrs. C. T. & J. N. Chester, No. 104 Center-street, this city.

L. C. M., of Iowa.—Oxalic acid will clean iron as easily as brass. Make up a dilute solution, and apply it quite hot with a sponge, then wash off with hot water, and dry perfectly.

J. J. S., of S. C.—We do not know any machine capable of being worked by animals, and of taking the place of an 8-horse power steam engine.

J. A. C., of Ga.—In our past volumes we have frequently stated that small hot-air engines varying from one up to four and five horse power were very safe, convenient and economical, and well adapted for driving machinery, where a small, uniform power was required.

C. M., of Ind.—A very strong solution of isinglass mixed with an equal amount of common whisky makes a very good liquid glue for common use. It is excellent for sticking labels, &c., but would be too expensive for coarse work. The addition of a little essential oil diminishes the tendency of glue to become moldy. Spaulding's prepared glue will not remain liquid when exposed to the atmosphere; we are not acquainted with his particular method of preparing it.

F. E., of Miss.—Write to D. A. L. Kennedy, President of the Polytechnic College, Philadelphia, and he will send you a circular containing a schedule of the terms for tuition, &c.

N. C., of Mich.—We do not think that any of the common black varnishes will remain very long as a coating for iron when exposed to hot brine, but we would advise you to make some experiments to test the question. You should employ a varnish made of fused asphalt and pure boiled linseed oil. Do not use litharge or any other poisonous drier in the varnish.

C. A. A., of D. C.—That the *Great Eastern* is a failure, in a financial point of view, is the general opinion in this country and England. The narrower a steamer is, the better for speed, but the worse for carrying capacity, for strength, and for stability on the water. More thorough knowledge of the subject will probably induce you to abandon the idea of a very deep keel for a great ship.

J. W. C., of Mich.—We know of no periodical which gives the lines of successful or experimental vessels.

W. W. H., of Pa.—We sometimes grind people's axes for them, and sometimes we do not. Your implement is not suited to our grinding-stone.

W. B. H., of Vt.—The brightest stars in the northeast, at 9 o'clock in the evening, are those in the constellation Cassiopeia. The bright planet in the southeast is Mars. You can probably procure the works on botany which you wish from C. S. Francis & Co., 554 Broadway, this city.

MONEY RECEIVED

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, August 11, 1860:—

W. V. G., of Conn., $50; J. W. S., of Ill., $30; J. A. H., of Cal., $30; J. F. H., of Maine, $30; M. D., of Minn., $25; W. R. C., of Ill., $25; U. B., of Mass., $30; W. J. C., of Ga., $20; J. C., of N. Y., $30; C. R. O., of N. Y., $30; J. B. M., of Ill., $25; S. S., of Kansas. $30; T. T. S., of Pa., $50; J. K. G., of Pa., $30; Van A. & L., of N. Y., $32; U. S., of Ohio, $30; P. C., of N. Y., $30; W. H. D., of Ill., $85, J. N. Y., of Ind., $20; J. C. S., of Mass., $108; G. B. F., of N. Y., $30; J. W. K., of N. Y., $25; C. & G., of Mass., $20; O. Des G., of Mo., $250; T. D. S., of Tenn., $12; W. L., of Pa., $25; J. D. G., of Mass., $25; J. D. H., of Miss., $30; J. S. S., of Ga., $25; S. & O. P., of Mich., $25; A. B., of N. Y., $30; J. C. T., of N. H., $25; M. & S., of Ga., $15; B. F. K., of R. I., $30; R. E. H., of Conn., $30; A. R., of N. J., $30; P. C. P., of N. Y., $30; S. H. & M. C. W., of Mass., $30; I. G., of Pa., $10; H. C., of N. C., $30; B. S., of S. C., $30; C. G., of Ohio, $30; W. H. L., of N. Y., $100; J. W., of N. Y., $25; A. P. C., of Ill., $25; J. F., of Va., $30; J. R., of Pa., $35; A. S. L., of Mass., $25; J. L. N., of N. Y., $25; T. M. T., of Ohio, $30; F. R. S., of Wis., $30; E. B., of N. Y., $25; A. S., of Pa., $30; A. St. D., of La., $25; A. & J. L., of Va., $25; J. E., of N. Y., $205; S. P., of N. Y., $25; E. G. O., of N. Y., $60; S. J. G., of N. Y., $30; T. & B., of N. Y., $30; F. H. K., of Ky., $30; L. S. C., of N. Y., $55; M. C. B., of Ill., $25; T. B., of Conn., $12.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, August 11, 1860:—

T. B., of Conn.; T. B., of Va.; A. P. C., of Ill.; W. V. G, of Conn.; J. W. K., of N. Y.; J. B. M., of Ill.; J. C. T., of N. H.; A. St. D. of La.; J. R., of Pa.; J. & C., of La.; W. L., of Pa.; S. & O. P., of Pa.; W. J. C., of Ga.; J. S. S., of Ga.; M. D., of Miss.; W. R. C., of Ill.; J. L. N., of N. Y.; C. S. of Mass.; J. M. T., of Pa.; J. G., of Mass.; A. S. L., of Mass.; J. W., of N. Y.; F. A. H., of Ill.; W. H. D., of Ill. (two cases); T. T. S., of Pa.; T. S., of Pa.; S. L. P., of N. Y.; S. P., of N. Y.; E. F. M. F., of Vt.; J. E., of N. Y.; W. H. L., of N. Y. (two cases); L. S. C., of N. Y.; B. S., of S. C.; P. C. D. D., of France.

NEW BOOKS AND PERIODICALS RECEIVED.

CASSELL'S ILLUSTRATED HISTORY OF ENGLAND; the text by J. T. Smith to the reign of Edward the First, and from that time by William Howitt. Cassell, Petter & Galpin, publishers, London and New York.

One of the most curious instances of immobility in the human mind is the slowness with which the world learns the value of pictures for imparting ideas. But this value is so great that it is forcing itself on the attention of the public, and the time is not distant when nearly all publications will be illustrated. Perhaps no other publishers have done as much to effect this reform as Cassell, Petter & Galpin. We have received the first part of their history of England, which is very copiously illustrated. The work is well written, and the drawings are very spirited; but the engraving and printing are execrable.

USEFUL HINTS TO OUR READERS.

BINDING.—We are prepared to bind volumes, in handsome covers, with illuminated sides, and to furnish covers for other binders. Price for binding, 50 cents. Price for covers by mail, 50 cents; by express, or delivered at the office, 40 cents.

SUBSCRIBERS TO THE SCIENTIFIC AMERICAN who fail to get their papers regularly will oblige the publishers by stating their complaints in writing. Those who may have missed certain numbers can have them supplied by addressing a note to the office of publication.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within 14 years, can obtain a copy by addressing a note to this office, stating the name of the patentee, and date of patent, when known, and enclosing $1 as fee for copying.

INVENTORS SENDING MODELS to our address should always enclose the express receipt, showing that the transit expenses have been prepaid. By observing this rule we are able, in a great majority of cases, to prevent the collection of double charges. Express companies either, through carelessness or design, often neglect to mark their paid packages, and thus, without the receipt to confront them, they mulct their customers at each end of the route. Look out for them!

GIVE INTELLIGIBLE DIRECTIONS.—We often receive letters with money inclosed, requesting the paper sent for the amount of the enclosure, but no name of State given, and often with the name of the Post-office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the Post-office at which they wish to receive their paper, and the State in which the Post-office is located.

BOUND VOLUMES.—Persons desiring the first volume of the New Series of the SCIENTIFIC AMERICAN can be supplied at the office of publication, and by all the periodical dealers; price, $1.50; by mail, $2, which includes postage. The volume, in sheets, complete, can be furnished by mail; price $1. Vol. II. is now bound and ready for delivery. The price for this volume is the same as that charged for Vol. I.

IMPORTANT TO INVENTORS.

THE GREAT AMERICAN AND FOREIGN PATENT AGENCY.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, are happy to announce the engagement of HON. CHARLES MASON, formerly Commissioner of Patents, as associate counsel with them in the prosecution of their extensive patent business. This connection renders their facilities still more ample than they have ever previously been for procuring Letters Patent, and attending to the various other departments of business pertaining to patents, such as Extensions, Appeals before the United States Court, Interferences, Opinions relative to Infringements, &c., &c. The long experience Messrs. MUNN & Co. have had in preparing Specifications and Drawings, extending over a period of fifteen years, has rendered them perfectly conversant with the mode of doing business at the United States Patent Office, and with the greater part of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between NINE and FOUR o'clock, daily, at their PRINCIPAL OFFICE, No. 37 PARK ROW, NEW YORK. We have also established a BRANCH OFFICE in the CITY OF WASHINGTON, on the CORNER OF F AND SEVENTH-STREETS, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at their office.

They are very extensively engaged in the preparation and securing of Patents in the various European countries. For the transaction of this business they have Offices at Nos. 66 Chancery Lane, London; 29 Boulevard St. Martin, Paris, and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European Patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

A pamphlet of information concerning the proper course to be pursued in obtaining patents through their Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the Principal Office or either of the Branches. They also furnish a Circular of Information about Foreign Patents.

The annexed letters, from the last three Commissioners of Patents, we commend to the perusal of all persons interested in obtaining Patents:—

Messrs. MUNN & Co.:—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill and fidelity to the interests of your employers. Yours, very truly,

CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

Messrs. MUNN & Co.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you have discharged your duties of Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability and uncompromising fidelity in performing your professional engagements. Very respectfully,

Your obedient servant, J. HOLT.

Messrs. MUNN & Co.:—Gentlemen: It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency, and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully,

Your obedient servant, WM. D. BISHOP.

Communications and remittances should be addressed to

MUNN & CO.,
Publishers, No. 37 Park-row, New York.

THE THIRTEENTH ANNUAL EXHIBITION OF the works of American Industry, by the Maryland Institute, will be opened in the city of Baltimore on Tuesday evening, October 9, 1860. Manufacturers, Mechanics, Artists, Inventors and others are most cordially invited to contribute to this exhibition. The utmost care will be exercised by the managers to make this exhibition both pleasant and profitable to the exhibitors, and especial attention will be given to the selection of judges, so as to insure complete justice in the distribution of awards and premiums, which will consist of Gold and Silver Medals, Silverware, Jewelry, &c., &c. Freights on machinery, by steamboat, from New York, Boston or Philadelphia will be free, or settled by the Institute; and if the owner is not present, by forwarding the bills of lading to the Chairman of the Committee, the goods will receive his personal attention in fitting-up and arranging the same for exhibition. From the success of our former exhibitions, the facilities and convenience offered at this exhibition, together with the central location of our city between North and South, gives us reason to believe that we shall be able to offer greater inducements to manufacturers, mechanics, artists, inventors and others to exhibit at this Fair than has ever been offered at any similar exhibition in this country. Circulars, containing regulations and arrangements, will be promptly furnished, on application to the Committee or JOHN S. SELBY, Actuary of the Institute.

E. WHITMAN,
8 4* Chairman of Committee on Exhibition.

CHEMICAL ANALYSIS.—PROCESS TO analyze and ascertain the purity of tallow soaps, $1; for alkalies, acids, bleaching salts, $1; wine and liquors, $2; soils and manures, $1; other processes, each, $1; apparatuses furnished, if required, for such processes at a low price. Address Professor H. DUSSANCE, New Lebanon, N. Y. 1*

J. R. STAFFORD'S OLIVE TAR.—WHEN Olive Tar is inhaled, its healing balsamic odors are brought in direct contact with the lining membranes of the Throat, Bronchial Tubes and all the air cells of the Lungs, relieving at once any pain or oppression, and healing any irritation or inflammation; when Olive Tar is taken upon sugar, it forms an unequaled soothing and healing sirup for Coughs and all Throat Diseases; when Olive Tar is applied, its magnetic or concentrated curative powers render it a most speedy and efficient PAIN ANNIHILATOR. Olive Tar is not sticky—does not discolor. Fifty cents a bottle, at No. 442 Broadway, New York, and by all druggists.

J. R. Stafford's IRON AND SULPHUR POWDERS are a soluble preparation of iron and sulphur, identical with that existing in the blood of a perfectly healthy person. Uniting with the digested food, they Re-vitalize and Purify the Blood; they impart Energy to the Nervous System; they Invigorate the Liver; they Strengthen the Digestion; they Regulate the Secretions of the Body, and are a Specific for all Female Weaknesses. Price $1 a package, at No. 442 Broadway, New York, and all druggists. 8

WEST TROY BELL FOUNDRY (ESTABLISHED in 1826).—The subscribers manufacture, and have constantly for sale at their old-established foundry, their superior Bells for churches, academies, factories, steamboats, locomotives, plantations, &c., mounted in the most approved and substantial manner, with their new patented Yoke and other improved mountings, and warranted in every particular. For information in regard to keys, dimensions, mountings, warrantee, &c., send for a circular. Address A. MENEELY'S SONS, West Troy, N. Y. 8 6

CHARLES A. SEELY, CHEMIST, NO. 424 Broadway, New York.—Analyses of ores, minerals, articles of commerce, &c. Advice and instruction in chemical processes generally; advice on chemical patents. 1*

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Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Skizzen von Erfindungen mit kurzen, deutlich geschriebenen Beschreibungen beliebe man zu adressiren an

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STOVER MACHINE COMPANY, NO. 13 PLATTstreet, New York—Manufacturers of Stover's Patent Eagle Molding Machine, for cutting and planing irregular forms of every description—illustrated in No. 25, Vol. I., SCIENTIFIC AMERICAN—and of the Stover & Coffin Patent Combination Planing Machine—illustrated in No. 19, Vol. II., SCIENTIFIC AMERICAN. Also, all kinds of Wood and Iron labor-saving machinery, Railroad Supplies, &c. &c. 1*

GRAY & WOODS' PATENT IMPROVED Planer; a combination of the Woodworth and Daniels' planers, particularly adapted for shop work, and for which we have obtained three patents and six medals. (See description and illustration in No. 6, Volume II., SCIENTIFIC AMERICAN.) Also, for sale, all kinds of wood-working machinery. Send for a circular. Address GRAY & WOODS, No. 69 Sudbury-street, Boston, Mass. 1 tf

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MUNN & CO., Scientific American Office, No. 37 Park-row, New York.

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DO RAILROAD RAILS EVER WEAR OUT?

In *Herapath's Railway Journal* (English), it is stated that, "at a late meeting of the West Flanders Railway, the editor having mentioned, on the experience of one of our ablest practical railway men, that the rails, unless at the stations and places where there is skidding, do not sensibly wear out, was afterwards spoken to by a gentleman and a railway chairman, who seemed to misunderstand what Mr. Herapath said, and adduced the splitting and exfoliation of some of the rails in disproof of what they called a theory. Lest others should run away with the same mistaken notions and misapprehensions, we think it necessary to say that the non-wearing-out applies to rails made of good iron, not inferior iron tinned over, as it were, with good, of which far too many rails are made, and to rails on the middle of a line over which the trains run in the ordinary way. Experiments have been made by taking-up and carefully weighing rails in this position after 12 months' wear or more, which were found not sensibly to have lost any weight during that time, thereby proving that there could have been no sensible wear. Besides, we have been assured that, after being down for many years, they showed no signs of material wear, which justified the statement which Mr. Herapath made on the authority given him. It is true that, near stations and places of 'shunting,' where there is much sliding and slipping by the application of the brakes or otherwise, there is a very sensible wear. But this is caused by slipping friction, not rolling, which is incomparably less than the former, though it seems we have ex-railway chairmen quite innocent of the knowlege of that simple fact." Rails made of the best iron cost more at first, but they endure three times longer than rails made of an inferior quality of metal, and the former are therefore the cheapest in the end.

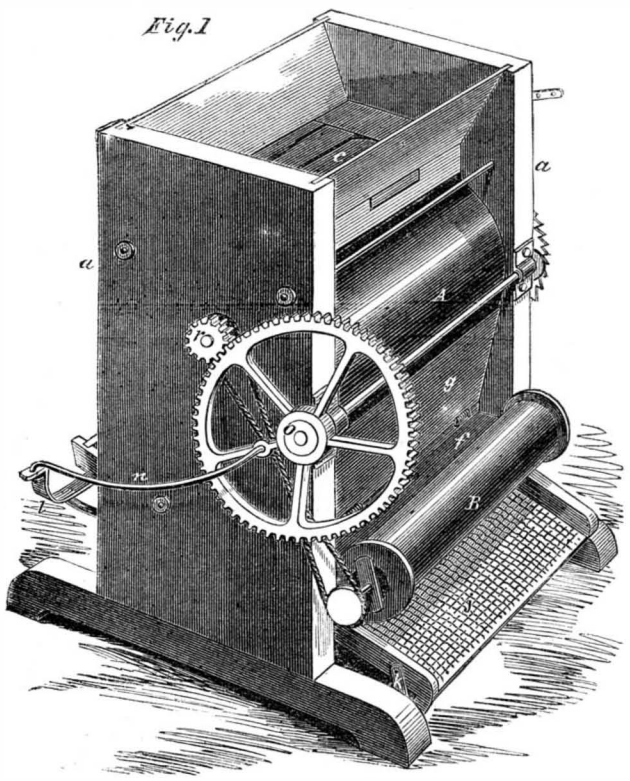
VOLCANO IN ICELAND.—There has been a volcanic eruption at Kotlugia, Iceland. The volcano has been at peace for 39 years, but has recently been in full swing. The eruption began with an immense casting-out of water (Iceland, it will be remembered, is the country of the *geysers* or hot springs); and this water deluged a large district of country, and destroyed several farms. To this succeeded a shower of ashes, accompanied by subterranean thunder; vast volumes of smoke, visible at a distance of 22 miles, notwithstanding the interposition of a high mountain range; and large fire-balls, presenting a spectacle of great sublimity and splendor. The eruption lasted three weeks; but, fortunately, did not effect as much damage as was at one time feared. The crater has often before committed far worse antics. An eruption is recorded in October, 1755, a fortnight before the earthquake which destroyed Lisbon; and with respect to another, which occurred in 1625, it is related that showers of ashes were thrown as far as Bergen, in Norway.—*Exchange.*

TO DESTROY MILLERS OR BEE MOTHS.—A correspondent of the New York *Evening Post* gave an account of his success with a plan which he adopted for the destruction of millers or bee moths, last year, as follows:—"When the season arrived, I put out a white plate, containing a mixture of molasses and vinegar well stirred up together. This I continued through all the warm nights of the latter part of July and forepart of August, setting the plate at night on a level with the bottom of a hive and near to it, and removing it in the morning. My success was most complete. I counted each morning the number caught during the night in the liquid on the plate, and in three or four weeks I trapped and killed one thousand. I mention these facts for the benefit of those who keep bees, and I have strong hopes that by adopting and making a thorough trial of this trapping system, the depredations of the millers may be arrested, and that they may be finally banished from the apiary."

IMPROVEMENT IN HOMINY MILLS.

Hominy is a word of Indian origin, meaning maize, or Indian corn, cracked in coarse pieces with the hull removed. In some parts of the country it is one of the staple dishes, and is very much relished. Many modes have been devised for breaking it, from the Indian method of pounding it with a stone pestle in a hole in the rock up to the most complicated contrivances of civilized man, and the plans for separating the hull from the grain have not been less numerous. The latest of these is illustrated in the accompanying engravings. It relates merely to the mode of separating the hull from the broken grain, and is intended to be applied to a hominy mill patented by Ezra Fahrney, May 5, 1855, and Jan. 5, 1858; though it is applicable to any one of those mills having its discharge opening at the bottom of a stationary cylinder or shell.

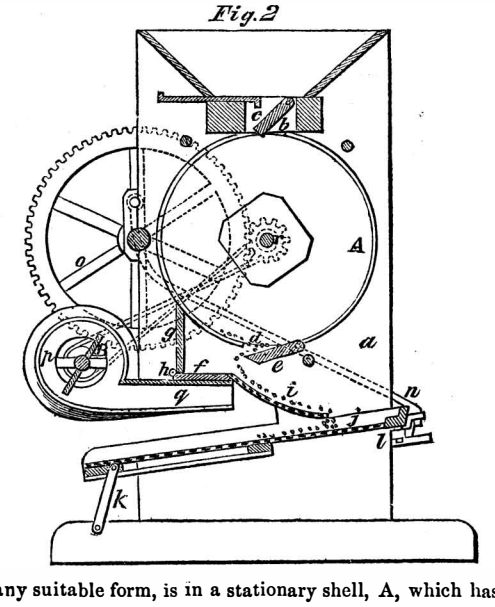
Fig. 1



DONALDSON'S IMPROVED HOMINY MILL.

In this mill, the grinding apparatus, which may be of

Fig. 2



any suitable form, is in a stationary shell, A, which has an opening, *b*, in the top, for the admission of the grain from the hopper, and another, *d*, in the bottom, for the discharge; the opening *b*, being closed by a valve *c*, which opens to admit a supply of grain for one operation, and then closes automatically. The opening, *d*, too, is closed by a self-operating valve which retains the grain until it is sufficiently broken, and then opens and allows it to discharge. As the grain escapes from the cylinder, it falls upon the curved screen, *i*, where it is encountered by a blast of wind from the revolving fan, B, and the light hulls are blown away. Thence it is conducted down upon the lower screen, *j*, the upper part of which is fine, and sifts out the heavy sand. The screens are fastened in a common frame which has a vibrating motion imparted to it by means of the rod, *n*, which connects the gear wheel *o*, with the lever, *l*; this lever having its fulcrum at the opposite end, and supporting the screen frame on a pivot in the middle. The board, *g*, is supported in its perpendicular position by means of spring hinges, which keep it in constant contact with the cylinder, notwithstanding the oscillations of the screen to which it is attached.

The patent for this improvement was obtained through the Scientific American Patent Agency, on January 24, 1860, and persons desiring further information in relation to it will please address the inventor, John Donaldson, at Rockport, Ill.

MATCHES WITHOUT SULPHUR.—Professor H. Dussance, of New Lebanon, N. Y., states:—"These fancy matches are easy to prepare. The wood must be drier than by the ordinary process; the ends of the matches must be heated till they seem a little burned; then you have a flat-bottomed dish, sheeted with tin or lead, on which is melted stearic acid, about ½ or ¾ of an inch deep. Put the ends of the matches in this bath and a little of the greasy liquid is absorbed by capillary attraction, penetrating all parts of the wood. The matches are then covered with a paste composed of phosphorus 3 parts; gum ½ part; water 3 parts; sand 2 parts; brown oxyd of lead 2 parts; coloring matter 1 part. These matches develop the light with more rapidity than those made with sulphur and do not emit any bad smell, for the wood and grease burn at the same time. The cost is about the same as that of the sulphur matches, for where you would use ten pounds of sulphur only one pound of stearic acid is required."

HOW TO BECOME A GOOD HORSEMAN.—A knowing writer on this subject, in laying down rules for riding on horseback, gives the following advice:—"Keep your head up, chin down, chest forward, shoulders back, elbows in, hands down, back in, belly out, feet forward, thighs fixed, knees in, loins loose, seat firm, hands tight, horse and rider well balanced, trot two hours every day without stirrups, and then time and perseverance may make you a good horseman."

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